

**PROJECT IMPLEMENTATION PLAN
LONG-RANGE RADAR SYSTEM
RELOCATION PROJECT
(ARSR-3 Leapfrog)**



5/3/93

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

RECORD OF CHANGES

DIRECTIVE NO.

6340.25

[illegible]

FOREWORD

This order transmits the Project Implementation Plan (PIP) for the Long Range (En Route) Radar Relocation (ARSR-3 Leapfrog) Project. The order guides and directs implementation planning for the ARSR-3 Leapfrog Project, identifies and describes required activities, and defines responsibilities to ensure that the ARSR-3 Leapfrog Systems are properly relocated for use in the National Airspace System (NAS). The order also establishes Federal Aviation Administration (FAA) program management, project implementation procedures and defines responsibilities governing the activities of participating organizations.

A handwritten signature in black ink, appearing to read "Richard Lay". The signature is stylized with a large, looped "R" and a cursive "Lay".

Richard Lay
Program Manager for En Route Radar

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CHAPTER 1. GENERAL

1. PURPOSE. This order, in establishing a project implementation plan (PIP), provides management direction and guidance for redistribution of long-range (en route) radar assets. The implementation plan includes the relocation of 10 air route surveillance radar systems, ARSR-3, which are replaced by installation of the new ARSR-4 long-range radar.
2. DISTRIBUTION. This order is being distributed to branch level in the offices of the Program Directors for Automation and Surveillance; Program Manager for Advanced Automation; NAS Systems Engineering; and the Associate Administrator for Contracting and Quality Assurance; to division level in the Systems Maintenance, Operational Support, the Office of Acquisition Support; Air Traffic Rules and Procedures, and Flight Standards Services; to the offices of Air Traffic Systems Management, Budget, Training and Higher Education; and Assistant Administrator for Civil Aviation Security; to branch level in regional Airway Facilities (AF) and Air Traffic (AT) divisions and to Airway Facilities sector field offices having long-range radar facilities; to division level at the FAA Logistics Center, the FAA Academy at the Mike Monroney Aeronautical Center; and to the FAA Technical Center.
3. DEFINITIONS. The abbreviations and acronyms used in this order are defined in appendix 1.
4. AUTHORITY TO CHANGE THIS ORDER. The Program Manager for En Route Radar (ANR-400) shall approve all changes to this order. Requests for changes to this Order should be directed to the Program Manager for En Route Radar, ANR-400, FAA Headquarters, 800 Independence Avenue S.W., Washington, DC 20591. Deviations from this order must be approved by ANR-400. The tentative installation schedule is contained in appendix 2. The actual installation dates are dependent on acceptance of the ARSR-4 LRR systems and Mode S beacon installations. Therefore, periodic update of the appendixes will be required. The program manager, ANR-400, shall approve changes to the appendixes.
- 5.-19. RESERVED.

CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS. This project provides for the further utilization of 10 ARSR-3 radars that will be replaced by the ARSR-4. These ARSR-3 radars will replace some of the ARSR-1, ARSR-2 (henceforth referred to as ARSR-1/2) long-range radars (LRR) and ex-military fixed pulse surveillance radar system, FPS-67b; will be utilized for establishment of new LLR sites; and will provide primary radar coverage at previously beacon-only sites (BOS).

a. The Leapfrog project encompasses the following:

(1) A site survey and site engineering report (SER) for each donor and each receive site, respectively.

(2) A system operational inspection (SOI) for verification of modifications and operational status of the ARSR-3's and support systems (prior to decommissioning), as applicable.

(3) Removal, packing, shipping, refurbishment of the antenna drive system (pedestal), radomes, and antenna towers, (as necessary), and reinstallation of the ARSR-3's, ATCRBS's, antennas, radomes, antenna towers, support systems and equipment.

(4) An SOI for verification of operational integrity prior to recommissioning.

(5) Testing and effecting the operational readiness demonstration (ORD).

(6) Removal and disposal of the replaced systems.

b. The ARSR-3 Leapfrog project is in conformance with Order 1000.1, Policy Statement of the Federal Aviation Administration, which is concerned with ensuring safety, promoting air commerce, supporting national security, and achieving effective airspace utilization. All actions to achieve the objectives of the project are to be based on the policy contained in the above orders, in the orders and documents listed in Chapter 5, Paragraph 57, and the deployment schedule, appendix 2, figure A.

21. PURPOSE. This project provides for the utilization of available ARSR-3 LRR to replace older systems and establish new primary radar sites as required. This will improve maintainability and availability of the LRR equipment at these sites in order to meet the increasing air traffic demands and to meet air traffic control (ATC) safety requirements.

22. HISTORY.

a. Need. Older LRR systems must be replaced with more modern, supportable equipment whenever possible. Sites selected to receive the ARSR-3 systems have been identified as priority sites.

b. Authorization. The FAA developed a new state-of-the-art design of primary LRR system, Model ARSR-4, per the recommendation of the ATC Advisory Committee, which would supplement and replace older generation systems, ARSR-1, -2, -3, and joint-use FPS series of LRR's. As approved in the Capital Investment Plan, dated December 1990, project 44-39 authorizes relocation of these ARSR-3's to replace the older systems.

c. Benefits. This project will result in an improvement in the ATC airspace coverage, safety, and productivity. It will enhance reliability, maintainability, and supportability of the National Airspace System (NAS).

23.-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION.

a. Project Concept. This project will provide **in-service** replacement of some ARSR-1/2 and FPS-67b radars in accordance with the schedule provided in Chapter 4 and appendix 2. In addition, one BOS site will receive an ARSR-3 installation. The final schedule for the project depends upon the installation and commissioning of the ARSR-4 radars necessary to free ARSR-3 assets. Preparation of the receive sites shall be completed on the basis of the current ARSR-4 delivery and commissioning schedule. The ARSR-3 Leapfrog project will require inter-regional cooperation and coordination of services, assets, installation activity, equipment transfers, short-term increased manpower, and equipment refurbishment requirements. Therefore, the field relocation activities may be performed through a technical assistance contractor(s) (TAC) under regional work releases. Work at the donor sites will be scheduled as necessary to avoid any conflict between the ARSR-4 installation/commissioning and this project.

b. Requirements.

(1) Existing LLR Sites. This project will consist of:

(a) Donor site survey of the complete ARSR-3 system with all associated Leapfrog items, including the radio frequency (RF) plumbing; radome; antenna; antenna tower; and support equipment; standby power system and air conditioning equipment, as required; available spare parts; instruction manuals; status of modifications; modification records; system specific tools and test equipment. Copies of the ARSR-3 Antenna Tower Design and Erection Drawings should be obtained during the site survey. Condition of the antenna tower structural steel members, radome, mounting hardware, antenna pedestal, drive gears, bearings, drive motors, azimuth data generation units, and rotary joint should be determined and recommendations made for refurbishment.

(b) Receive site survey of the ARSR-1/2 or FPS-67b LRR systems will:

1 Determine the scope of work and equipment requirements to successfully effect the relocation of the ARSR-3 system, support systems, equipment, and materials;

2 Determine the ARSR-3 antenna tower location and height with particular attention to RF radiation

hazard to personnel while working on the towers, airspace coverage, and the towers blocking critical airspace areas during the period when the two towers are onsite. The Technical Officer's Representative (TOR) onsite will coordinate with AT prior to the site survey to obtain data regarding the lease critical airspace areas for consideration;

3 Determine building requirements.

a If a new building is required, establish type, size, and location.

b If existing buildings will be used, determine specific space requirements, modifications required, need for temporary space (trailers, etc.) while both systems are installed.

(c) Site engineering report (SER), specifically for each site, from the respective site survey, to include a detailed procedure for accomplishment of the entire relocation process, including any additional testing that may be required due to site specific requirements. ASM-500, Spectrum Management Office, will be contacted at the time of the receive site survey to arrange for transfer or assignment of radar frequencies, pulse rate frequencies (PRF), etc. which will be incorporated into the final receive site SER.

(d) Donor site SOI of the ARSR-3 system, testing to meet operational tolerances, per Order 6340.13A, Maintenance of Air Route Surveillance Radar, ARSR-3 Facilities, immediately prior to decommissioning and shut-down. SOI of the support systems as required (including the ATRBS if being Leapfrogged). The SOI will be performed in a manner so as to assure no conflict with the ARSR-4 commissioning or ATC operation.

(e) The Airway Facilities (AF) Sector will assure, unless otherwise excepted in the SER, that all site specific modifications are removed, with care, prior to system removal and shipment.

(f) Remove, disassemble, and pack/crate the ARSR-3 system, including:

- 1 ARSR-3 antenna reflector.
- 2 Primary and secondary radar antenna feed systems.
- 3 Reflector support, antenna.

- 4 Pedestal, antenna.
- 5 Drive motors, antenna.
- 6 Rotary joint.
- 7 Azimuth data generation units.
- 8 Waveguide, with associated hangers,
suspension and mounting hardware.
- 9 Radio-frequency (RF) plumbing components
and associated hardware.
- 10 Waveguide switch and dummy loads.
- 11 Waveguide and beacon RF cable
pressurization system.
- 12 Transmitter coolant systems.
- 13 Transmitter air conditioning systems.
- 14 Beacon RF cables, and associated hangers,
and mounting hardware.
- 15 Lightning arresting system.
- 16 Obstruction system.
- 17 Antenna radome.
- 18 Antenna drive control boxes
- 19 Antenna polarization control box
- 20 Antenna tower door interlock/safety switch
with keys
- 21 Grounding/bonding system.
- 22 Antenna tower, with stairway and siding.
- 23 Remoting subsystems (MODEM), as
applicable, with associated equipment/mounting hardware.
- 24 Weather digitizer equipment, as
applicable, with associated support equipment and mounting
hardware.

25 Standby power engine/generator (E/G) system with fuel tanks, as applicable.

26 Power distribution panels.

27 System specific tools and test equipment.

28 All related instruction manuals.

29 all related modification records.

30 All equipment documentation at the donor site, including the ARSR-3 Tower and Erection drawings. See figures 3-1 through 3-9 for equipment complement.

(g) Transport/ship the ARSR-3 antenna reflector, ARSR-3/Air Traffic Control Radar Beacon System (ATCRBS) feed system, supports, pedestal, drive motors, rotary joint, tower members (structural steel), radome, suitably crated, via flatbed truck to the receive site or to the TAC depot, as required.

NOTE: The antenna tower structural steel members, mounting hardware, antenna pedestal, drive gears, bearings, motors, and rotary joint will be refurbished as required. See figures 3-1 through 3-9 for equipment complement.

(h) Transport/ship all of the electronics equipment, azimuth data generation units, waveguide, associated hardware and cables, spares, and documentation via padded van to the receive site.

(i) Installation of the ARSR-3 system, including:

1 Antenna tower, with stairway and siding.

2 Grounding/bonding system.

3 Azimuth pedestal.

4 Antenna drive motors.

5 Antenna reflector support

6 ARSR-3 antenna reflector

7 Primary and secondary radar feed systems.

8 Antenna radome.

- 9 Lightning arresting system.
- 10 Obstruction light system.
- 11 Rotary joint.
- 12 Azimuth data generation units.
- 13 Antenna drive control boxes.
- 14 Antenna polarization control box.
- 15 Antenna tower door interlock/safety switch with locks, keys, and associated hardware.
- 16 Waveguide, with hangers, suspension, and mounting hardware.
- 17 Beacon RF cables, associated hangers, and mounting hardware.
- 18 RF plumbing components and associated hardware.
- 19 Waveguide switch and dummy loads.
- 20 Waveguide and beacon RF antenna cable pressuring system.
- 21 Transmitter coolant system.
- 22 Transmitter air conditioning system.
- 23 Remoting subsystems (MODEM), as applicable, with associated equipment/mounting hardware.
- 24 Weather digitizer equipment, as applicable, with associated support equipment and mounting hardware.
- 25 Standby power E/G systems, with fuel tanks, as applicable.
- 26 Power distribution panels.
- 27 System specific tools and test equipment.
- 28 All related instruction manuals.

29 All related modification records.

30 All documentation from the donor site, including the ARSR-3 Tower and Erection drawings. See figures 3-1 through 3-9 for equipment complement.

31 Remote maintenance monitor (RMM), and support equipment, as required.

32 ATCRBS, as required, with associated hardware.

33 Integral systems monitor (ISM), as required.

34 Government furnished equipment (GFE) remote system monitor (RSM) and support equipment, as required.

(j) Systems Operational Inspection (SOI) of the ARSR-3 long range radar system, the air traffic control beacon interrogator (ATCBI) system, the remoting system, and all other interface equipment/subsystems affected by the installation effected by this order. The ARSR-3 and the ATCBI systems will be tested to meet initial tolerances, as a minimum, per Orders AF 6340.13A Maintenance of Air Route Surveillance Radar, ARSR-3 Facilities and 6360.1b or 6360.14A (as applicable).

(k) A contractor acceptance inspection (CAI) will be performed on the ARSR-3 LRR system, the ATCRBS system, the remoting system and all other interface equipment/ subsystems affected by the installation, testing, and commissioning effectuated by this order.

(l) A flight inspection of the ARSR-3 Leapfrog system will be performed as required by Operational Support Service (AOS) and Region, augmented by the use of automated tools. Prior coordination will be effected by the TOR.

(m) A joint acceptance inspection (JAI) will be performed on the ARSR-3 LRR system, the ATCRBS system, the remoting system, and all other interface equipment/subsystems affected by the installation, testing, and commissioning effectuated by this order.

(n) An operational readiness demonstration (ORD), including system optimization, integration and any additional testing to satisfy unusual site requirements, is the final stage of the operational testing and evaluation (OT&E). The ORD will be performed on the ARSR-3 LRR system, the ATCRBS system, the

remoting system, and all other interface equipment/subsystems affected by the installation, testing, and commissioning effectuated by this order. The ORD will be the responsibility of regional personnel or their designated representatives. The ORD will be performed in accordance with the manufacturers' technical instruction books (TIB) and applicable agency orders. The goal of ORD is the exercising test and evaluation of a system in an operational environment satisfactorily to support the determination that the system is ready for full operation as part of the NAS. This includes testing and evaluation (T&E) to certify and confirm that, all requirements are met when the system is operated and maintained by operational personnel in an operational environment. Testing should reflect the operational readiness of people, procedures, and the system to assume field operational status.

(o) Removal and disposal of the ARSR-1/2 or FPS-67b system and associated support equipment at the receive site, following the ARSR-3 installation, testing, and commissioning as site requirements dictate. The ARSR-1/2 or FPS-67b system and associated support equipment will be prepared for disposal and disposed of per FAA instructions at that time.

(2) Newly Established Sites Only. The relocation installation will include the Leapfrog GFE ATRBS, GFE beacon test set, the GFE radar beacon performance monitor (RBPM), including the integral system monitor (ISM) and the GFE remote system monitor (RSM). The RSM may also be Leapfrogged to unmanned receive sites.

(a) Installation will involve support equipment, including the remoting subsystem, RMM, Remoting MODEM or remote communication link (RCL) (or both), as required to meet FAA, United States Air Force (USAF), or United States Navy (USN) requirements; standby power system with fuel tanks; associated hardware; and support equipment, as required.

(b) Regional site preparation may include establishment of structures, utilities, access roads, security environment, commercial power substation, water systems, waste disposal facilities, communications facilities, etc.

(c) Notification and request to the Spectrum Engineering Division, ASM-500, to arrange for the transfer or selection of new ARSR-3 frequencies and pulse rates for each site.

c. Design Considerations. The ARSR-3 is a radar of proven design that has been operational within the NAS for over 10 years. No new design features are required or intended in order to effect the planned relocations. The ARSR-3 equipment cabinets are physically similar in size to the ARSR-1/2 or FPS-67b but will occupy considerably less space (only 7 cabinets) than that vacated by the ARSR-1/2 equipment (11 cabinets) or the FPS-67b equipment (17 cabinets).

d. Reliability/Maintainability. The ARSR-3 system design represents a considerable improvement over the ARSR-1/2 and FPS-67b systems with near state-of-the-art design and components. Features of the ARSR-3 system design which enhance the reliability and maintainability include:

(1) All electronic components are solid-state, with the exception of the transmitter klystron tubes, and are arranged on circuit boards which are interchangeable and easily replaceable as a unit.

(2) The modular design allows the maintenance technicians to diagnose the failed circuit at a central card tester.

(3) The RMM provides overall diagnostic testing of the ARSR-3 system and site parameters, from a remote location.

(4) Mean-Time-Between-Failures (MTBF) is much greater.

(5) Mean-Time-To-Repair (MTTR) is substantially reduced.

e. Supportability. A basic design consideration in the ARSR-3 system is the newer near state-of-the-art solid-state card design, allowing relatively major changes to be made within each subsystem without severe impact on the remainder of the system hardware and facilitating acquisition of parts, support, and test equipment required for life-cycle maintenance of the equipment.

31. PHYSICAL DESCRIPTION. The ARSR-3 system is comprised of seven basic cabinets. Each system includes control boxes, numerous interconnecting data cables, control cables, and cable junction boxes. Orientation of the ARSR-3, ATCRBS system, associated subsystems, and equipment will vary from site to site according to type of facility shelter. The ARSR-3 typical site and equipment configurations are shown in figures 3-1, 3-2, and 3-3.

- a. ARSR-3 Major System Components. The major system components located at the ARSR-3 sites are listed in figures 3-1 through 3-9.
- b. ARSR-1/2 Equipment Configuration. The typical equipment configuration of the ARSR-1/2 is shown in figure 3-11.
- c. ARSR-1/2 Major System Components. Major system components located at the ARSR-1/2 sites are listed in figures 3-12 through 3-14.
- d. FPS-67b Equipment Configuration. The typical equipment configuration of the FPS-67b is shown in figure 3-15.
- e. FPS-67b Major System Components. Major system components located at the FPS-67b site are listed in figures 3-16 through 3-18.

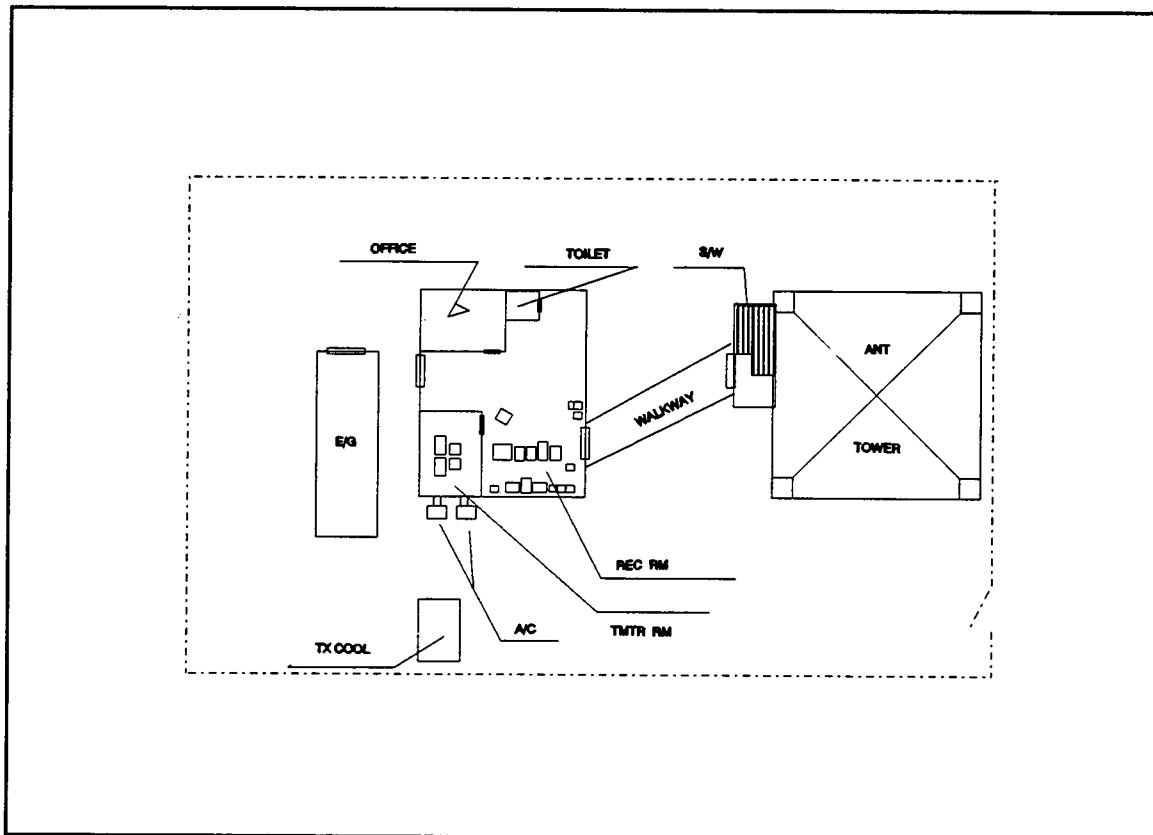
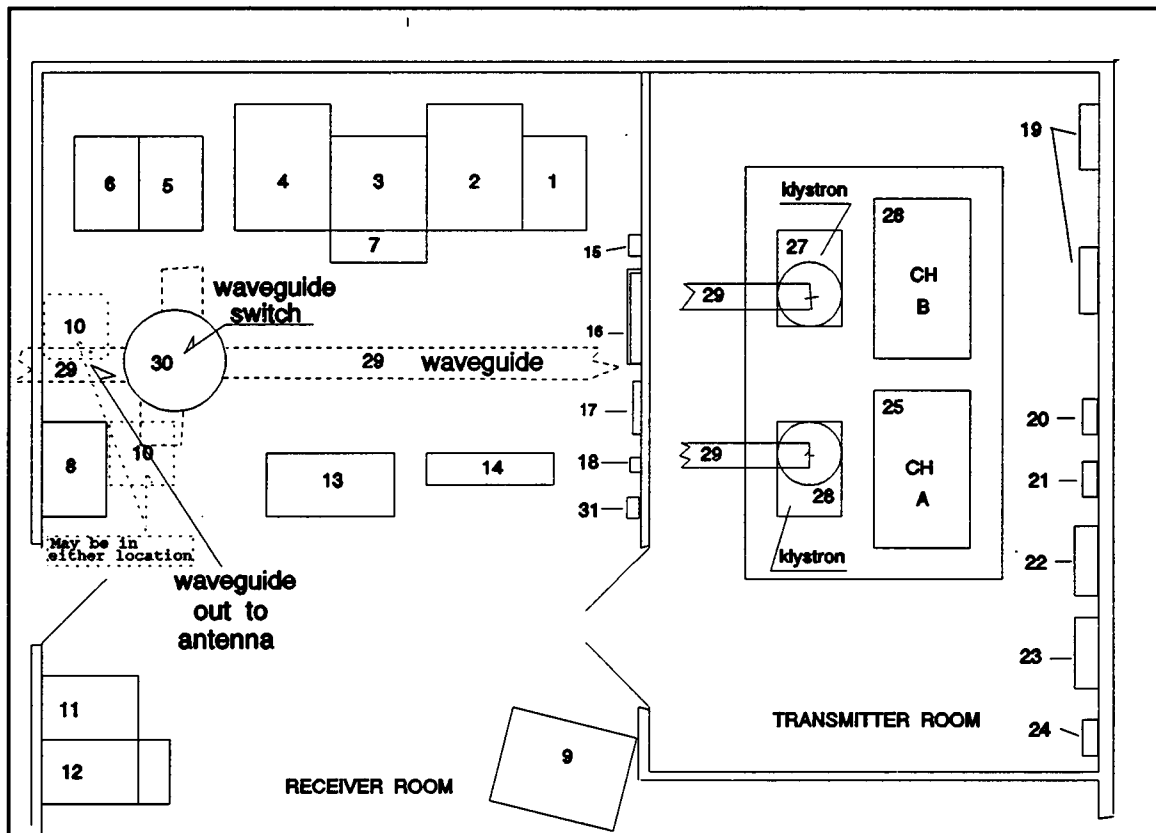
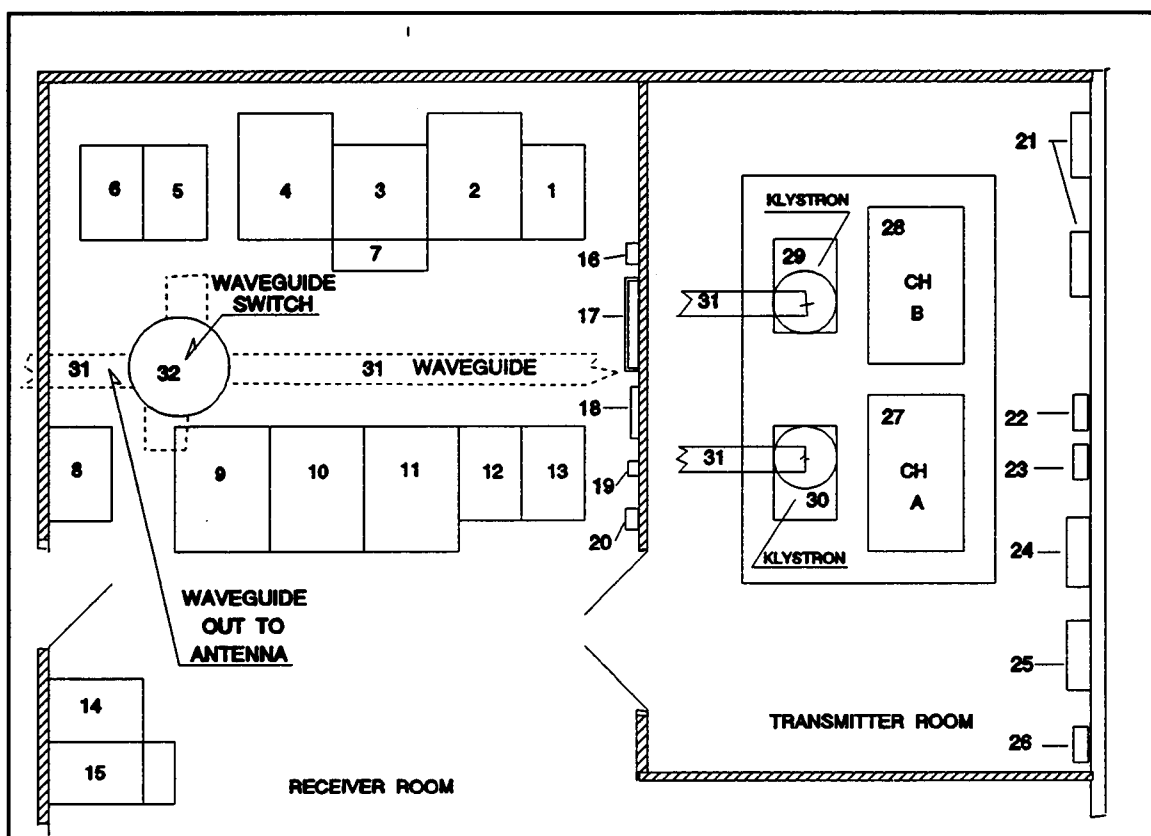
FIGURE 3-1. ARSR-3 TYPICAL SITE LAYOUT

FIGURE 3-2. ARSR-3 TYPICAL DONOR SITE EQUIPMENT LAYOUT

ARSR-3 TYPICAL DONOR SITE EQUIPMENT LAYOUT (Cont'd)

KEY:

- | | |
|------------------------------|-------------------------------|
| 1 - MODEM | 16 - Power Distribution |
| 2 - ARSR-3 Receiver, Chan B | Panel (PDP) |
| 3 - Receiver Interface Unit | 17 - Telco Junction Box |
| 4 - ARSR-3 Receiver, Chan A | 18 - Equipment PDP |
| 5 - ATCBI, Chan B | 19 - Transmitter Coolant |
| 6 - ATCBI, Chan A | Manifold (2 ea) |
| 7 - Radar Display | 20 - Engine/Generator Control |
| 8 - ATCBI Integral System | 21 - Telco/Intercom Unit |
| Monitor | 22 - Utilities PDP |
| 9 - Radar Display | 23 - Main Equipment PDP |
| 10 - Remote Maintenance | 24 - Power Line Monitor |
| Monitor | 25 - Transmitter, Chan A |
| 11 - Weather Digitizer | 26 - Transmitter, Chan B |
| 12 - ARSR-3 Card Reader | 27 - Klystron Unit, Chan B |
| 13 - Desk/Work space | 28 - Klystron Unit, Chan A |
| 14 - Workbench | 29 - Waveguide Run |
| 15 - Telephone/Intercom Unit | 30 - Waveguide Switch |
| | 31 - Sola Regulators (2 ea) |

FIGURE 3-3. ARSR-3 JSS TYPICAL EQUIPMENT LAYOUT

ARSR-3 JSS TYPICAL EQUIPMENT LAYOUT (Cont'd)

KEY:

- | | |
|---|---|
| 1 - MODEM | 18 - Power Distribution Panels |
| 2 - Receiver, Chan B | 19 - Telco Junction Box |
| 3 - Receiver Interface Unit | 20 - Equipment PDP |
| 4 - Receiver, Chan A | 21 - ATCBI Sola Regulators
(2 ea) |
| 5 - ATCBI, Chan B | 22 - Transmitter Coolant
Manifold |
| 6 - ATCBI, Chan A | 23 - Engine/Generator Remote
Control |
| 7 - Radar Display (under) | 24 - Telco/Intercom |
| 8 - ATCBI Integral System
Monitor | 25 - Utility PDP |
| 9 - Radar Display | 26 - Main Equipment PDP |
| 10 - Video Mapper | 27 - Power Line Monitor |
| 11 - Video Processor | 28 - Transmitter, Chan A |
| 12 - Military Interface Module
(MIM) | 29 - Transmitter, Chan B |
| 13 - MIM Processor | 30 - Klystron Unit, Chan B |
| 14 - Remote Monitor Equipment | 31 - Klystron Unit, Chan A |
| 15 - Weather Digitizer | 32 - Waveguide |
| 16 - ARSR-3 Card Reader | 33 - Waveguide Switch |
| 17 - Telco/Intercom Unit | |

FIGURE 3-4. ARSR-3 TYPICAL EQUIPMENT
TRANSMITTER ROOM

<u>Key</u>	<u>Qty</u>	<u>Width</u>	<u>x</u>	<u>Depth</u>	<u>x</u>	<u>Height</u>
Radar Modulator Cabinet	2	54"		31"		~80"
Final Power Amplifier Unit	2	46"		28"		~42"
Transmitter Coolant Compressor/Chiller						
System Concrete Pad	1	15'6"		9'8"		6"
Evaporator Unit	2	54"		55"		48"
Coolant pumps	4					
Float Switch/reservoir	2					
Transmitter Coolant Manifold System	2			A & B channels		
Transmitter Heat Extractor#				A & B channels		
Hoist/Rail Assembly	1					
Associated Waveguide Sections		Site dependent.				
Site Spares (ARSR-3)		Per the initial supply support allowance chart (ISSAC).				
Cabinet Interconnecting Cables, Grounds, etc		Site dependent.				

Site specific modification installed in certain facilities.

**FIGURE 3-5. ARSR-3 TYPICAL EQUIPMENT
RECEIVER ROOM**

<u>Equipment</u>	<u>Qty</u>	<u>Width</u>	<u>x</u>	<u>Depth</u>	<u>x</u>	<u>Height</u>
Receiver Cabinet	2	32 1/4"		36"		80"
Display	2	30"		40"		47"
Receiver Interface Cabinet ##	1	32"		36"		25"
RMM	1	24 1/4"		30 1/2"		78"
MIM #	2	32 1/4"		36"		81"
Radar Cable Junction Box (RCJB)	1	~30"		~10"		~30"
Military Interface Module Cable Junction Box (MIMCJB) #	1	~30"		~30"		~30"
Remote Maintenance Monitor Junction Box (RMMJB)	1	30"		10"		36"
Maintenance Data Terminal (PC, Monitor, & Printer)	1	-		-		-
Dummy Load Coolant Distribution System	2 ea			(A & B channels)		
Site Spares	Per ISSAC.					
Cabinet Interconnecting Cables, Grounds, etc	Site dependent					
Associated Waveguide Components, Dummy Loads, Waveguide Switches, Isolators, Couplers, Hangers, Misc Hardware, etc.	Site dependent					

For use in Joint Surveillance Site (JSS) facilities only.

Mounted above one of the displays located between the
two receiver/processor cabinets

FIGURE 3-6. ARSR-3 TYPICAL RADAR ANTENNA
and ASSOCIATED EQUIPMENT

<u>Equipment</u>	<u>Qty</u>	
Feedhorn Assembly, ARSR/CP-LP/ATCRBS (RIVDIF)	1 ea	
Reflector	1 ea	
Reflector Support	1 ea	
Antenna Pedestal	1 ea	
Rotary Joint	1 ea	
Drive Motor	2 ea	A & B channels
Azimuth Pulse Generator		
Antenna Control Box	2 ea	A & B channels
Status & Polarization Control Box	1 ea	
Assembly	2 ea	A & B channels
Hoist & Rail Assembly	1 ea	
Drive Motor's Forklift	1 ea	
Spare Parts	Per ISSAC.	
Associated Waveguide Components, Waveguide Switches, Isolators, Couplers, Hangers, Misc Hardware, etc.		Site dependent.

FIGURE 3-7. ARSR-3 TYPICAL RADAR ANTENNA TOWER
AND ASSOCIATED EQUIPMENT

<u>Equipment</u>	<u>Qty</u>	<u>Width</u> x	<u>Depth</u> x	<u>Height</u>
Tower	1	36'	36'	75'
Antenna Control Boxes Status & Polarization Control Box	2	~24"	~24"	~6"
Antenna tower door inter- lock/safety switch, w/locks and keys and associated hardware	1	~24	~30"	~6"
Rigid Structure Dome	1 ea			
Lightening Rods/ Grounding System & Assoc. Cabling & Hardware	1 ea, including all spare sections.			
Obstruction Lights, Assoc Wiring, Switch Controls, etc.	All components, except buried components.			
Tower Structure Including Platform, Stairs, Corrugated Siding, and Assoc. Hardware	Per FAA standard.			
Waveguide Presssur- ization System	Site dependent.			
w/Air Compressor and Tank w/Plumbing, Hoses, Tubes, Electrical Controls, Cables, Switches, Assoc. Hardware, and Spares	2 ea		A & B channels	
	2 ea		A & B channels	
	Site dependent			

FIGURE 3-8. ARSR-3 TYPICAL EQUIPMENT
ENGINE/GENERATOR STANDBY POWER

<u>Equipment</u>	<u>Qty</u>	<u>Width</u>	x	<u>Depth</u>	x	<u>Height</u>
The following equipment is mounted in a prefabricated shelter, w/lifting eyes:						
outside dimensions	1 ea	10'		37'		9'3"
overall gross weight		20,000 pounds				
Engine/Generator		Capacity = 125 kw				
Service Entrance Switch	1 ea					
Power Transfer Switch	1 ea					
Bypass Switch	1 ea					
Load Bank	1 ea					
Underground Fuel Tank w/lines	1 ea	Capacity = 3,000 gallons				

FIGURE 3-9. ARSR-3
SPECIAL TEST EQUIPMENT

<u>Equipment</u>	<u>Qty</u>	<u>Width</u>	x	<u>Depth</u>	x	<u>Height</u>
Card Reader w/Instruction Manuals	1	25 3/4"		30"		72"
Random Access Memory (RAM) Tester w/Instruction Manuals	1	~14"		~3"		~8"
Pulse Forming Network (PFN) Component Reader FA-9231 w/Instruction Manuals	1	~12"		~12"		~36"

FIGURE 3-10. ARSR-3 EQUIPMENT
INSTRUCTION MANUALS

<u>Equipment</u>	<u>Qty</u>
ARSR-3 Long-Range Radar Instruction Manuals	2 Sets, 28 volumes each
ARSR-3 Military Interface Module Instruction Manuals	2 Sets, 5 volumes each
Remote Maintenance Monitor Modification Handbooks	2 Sets
Misc Support Equipment Instruction Manuals	2 Sets

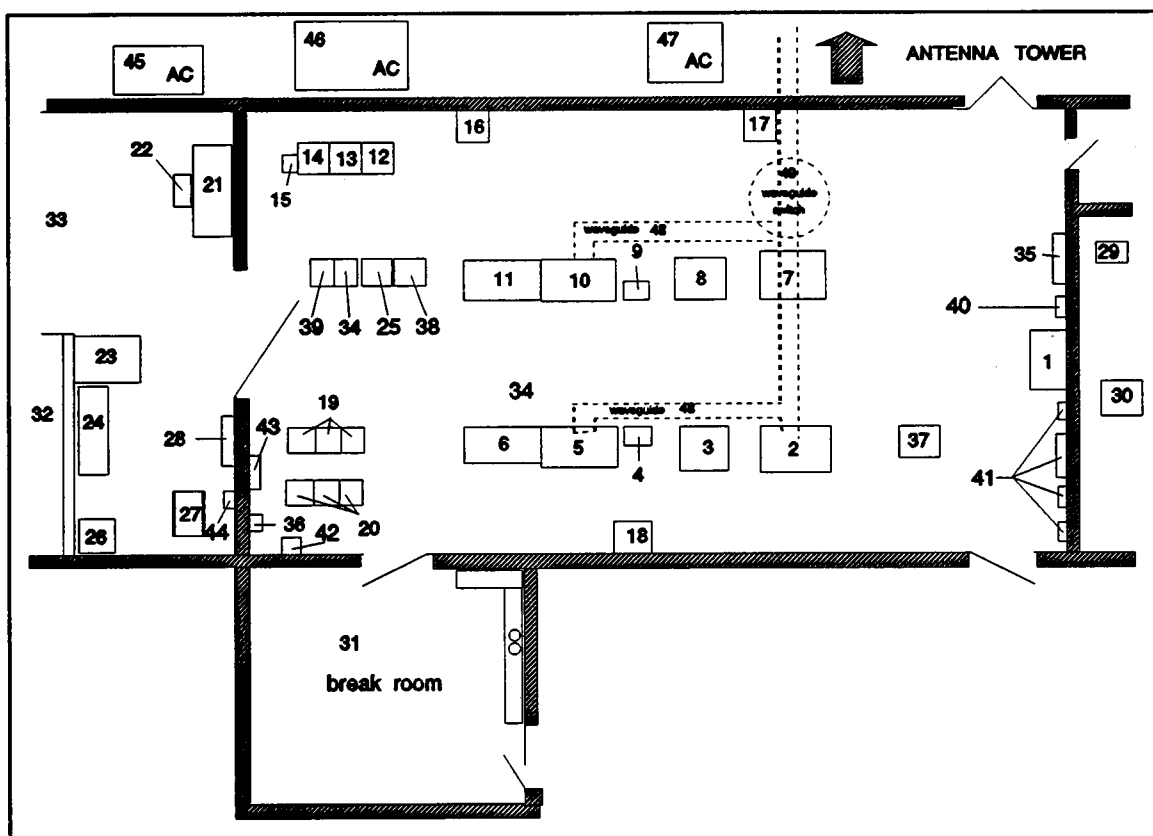
FIGURE 3-11. LEAPFROG ADDITIONAL EQUIPMENT
FOR NEWLY ESTABLISHED ARSR-3 SITES

<u>EQUIPMENT</u>	<u>Width</u>	<u>Depth</u>	<u>Height</u>	<u>Weight</u>
ATCBI Tx/Rx Rack Ch 1	19 3/4"w	x 22" D	x 76" H	235 lbs
ATCBI Tx/Rx Rack Ch 2	19 3/4"w	x 22" D	x 76" H	235 lbs
ISM Rack	22"W	x 22 5/8"D	x 76"H	235 lbs
RF (Beacon) Test Set w/cart	25"W	x 32"D	x 57"H	400 lbs#
Sola AC Regulator, ## 2 each	6"W	x 15"D	x 6"H##	50 lbs#
ATCBI Antenna (RIVDIF)	1 each			
Remote Maintenance Monitor	2 ea rack	(dual channels)		
Remoting Subsystem (MODEM or RCL Equipment	1 ea system			
w/antenna and RF cables)	1 ea rack	(dual channels)		
Engine/Generator	1 ea 125 KW,	if available at donor		
w/Fuel Tank	site			
Instruction Manuals for Systems/equipment	2 sets			

Estimated.

One Sola regulator normally mounted atop each ATCBI Tx/Rx rack, however, sometimes mounted on the building wall.

FIGURE 3-12. LEAPFROG TYPICAL ARSR-1/2 SITE EQUIPMENT LAYOUT



LEAPFROG TYPICAL ARSR-1/2 SITE
EQUIPMENT LAYOUT (Cont'd)

Key:

- | | |
|---|--|
| 1 - Radar Set Cont Cab | 25 - BUEC/Wx Digitizer |
| 2 - Chan A Xmtr Mod Cab | 26 - MODEM |
| 3 - Chan A SS Rcvr Cab | 27 - Weather MODEM |
| 4 - Chan A AC Volt Reg | 28 - CD RCJB |
| 5 - Chan A Amplitron Mod Assy | 29 - Wg Pressure Equip |
| 6 - Chan A Amplitron PS Cab | 30 - E/G Room |
| 7 - Chan B Xmtr Mod Cab | 31 - Break Room |
| 8 - Chan B SS Rcvr Cab | 32 - Office |
| 9 - Chan B AC Volt Reg | 33 - Maintenance Area |
| 10 - Chan B Amplitron Mod Assy | 34 - Regulation Amps (comm) |
| 11 - Chan B Amplitron PS Cab | 35 - Ant Con Cab (not used) |
| 12 - ATCBI ISM Rack | 36 - Sola Regulators (ATCBI-5) |
| 13 - ATCBI Channel B | 37 - VHF Omni Test Sys (VOT) |
| 14 - ATCBI Channel A | 38 - Weather Digitizer |
| 15 - ATCBI RF Test Set | 39 - TMLRA/TMLRB |
| 16 - Remote Control Interface Unit (RCIU) | 40 - Military RCJB (not in use) |
| 17 - MODEM (USAF) | 41 - Power Panel (ex-military) |
| 18 - ARSR-1/2 Test Set | 42 - Building Light Control |
| 19 - RCL | 43 - PDP (lights) |
| 20 - Telcom Rack | 44 - PDP CD Room |
| 21 - CD 2 | 45 - CD Room Air Conditioner |
| 22 - CD 2 Display | 46 - Equip Room Airconditioner |
| 23 - CD 1 Display | 47 - Equip Room Airconditioner & Transmitter Coolant Sys |
| 24 - CD 1 | |

FIGURE 3-13. LEAPFROG TYPICAL ARSR-1/2 EQUIPMENT
TO BE REMOVED FROM SITE

<u>LOCATION</u>	<u>ITEM</u>	<u>QTY</u>
ARSR-1e Equipment Room:		
Transmitter Magnetron Cabinet	2 ea	A & B channels
Amplitron Modulator Assembly	2 ea	A & B channels
Amplitron Power Supply Unit	2 ea	A & B channels
Transmitter/Receiver		
Voltage Regulator	2 ea	A & B channels
Solid-State (SS) Receiver		
Cabinet	2 ea	A & B channels
Radar Set Control Cabinet	1 ea	
Azimuth Pulse Amplifier & Terminal Box	1 ea	
Radar Antenna Starter		
Control Box	1 ea	
Waveguide Compressor Unit	1 ea	
w/controls, plumbing/ cabling, etc.	1 ea	
Tx Coolant System		
(Compressor/Pumps/Plumbing/ Controls) for Magnetron/ Amplitron/Load Isolators	2 ea	A & B channels
Common Digitizer I	1 ea	
CD I Display	1 ea	
Common Digitizer II	1 ea	
CD II Display	1 ea	
CD I MODEM	1 ea	
Remote Control Interface Unit	1 ea	
Radar Cable Junction Box	1 ea	
Military Cable Junction Box	1 ea	
Site Spares (ARSR-1e, CD-I, CD-II, MODEM's, etc.)	All onsite.	
Cabinet Interconnecting Cables, Grounds, etc.	All, to be removed entirely.	
Associated Waveguide Components, Dummy Loads, Waveguide Switches, Isolators, Couplers, Hangers, Misc Hardware, etc.	All, to be removed entirely.	

LEAPFROG TYPICAL ARSR-1/2 EQUIPMENT
TO BE REMOVED FROM SITE (Cont'd)

Waveguide Run:	
Waveguide (from transmitter/ receiver cabinets to the antenna rotary joint), Including all Hangers and Associated Hardware	All, to be removed entirely.
Radar Antenna:	
Feedhorn Assembly, ARSR/CP-LP/ATCRBS (RIVDIF)	1 ea
Reflector	1 ea
Reflector Support	1 ea
Antenna Pedestal	1 ea
Rotary Joint	1 ea
Drive Motors	2 ea
Azimuth Data Generator Assembly	2 ea
Hoist & Rail Assembly	1 ea
Spare Parts	All onsite.
Associated Waveguide Components, Waveguide Switches, Isolators, Couplers, Hangers, Pressurizing accessories, Misc Hardware, etc.	All, to be removed entirely.
ATCRBS RF Antenna Cable	All, to be removed entirely.
Radar Antenna Tower:	
Rigid Structure Dome	1 ea
Waveguide, with Associated Waveguide Components, Waveguide Switches, Isolators, Couplers, Hangers, Misc Hardware, etc.	All, to be removed entirely.
Antenna/Door Safety Switch w/Conduit, Wiring, etc	1 ea
Antenna Junction Box w/Assoc. Hardware, Wiring, etc.	1 ea
ATCRBS RF Antenna Cable, RG-214U	All, to be removed entirely from the antenna to the tx/rx couplers.
Antenna/Door Safety Switch, w/Conduit, Wiring, etc.	1 ea

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NOTE: The solid-state receiver cabinets, waveguide, waveguide components, waveguide pressurization equipment, common digitizer systems/displays, CD MODEM, and the RCIU will be removed, handled, and packaged (mark for "E&R") so as to permit reuse of the equipment upon return to the Logistics Center. All other equipment will be handled as salvage, unless otherwise directed by the FAA at that time. All equipment will be disposed of per FAA instructions at that time (See para 94).

FIGURE 3-14. LEAPFROG TYPICAL ARSR-1/2
EQUIPMENT DIMENSIONS

Radar Equipment Room:	Qty	Width	x	Depth	x	Height
Tx/Magnetron Cabinet	2 ea	40"		34"		74"
Tx/Amplitron Power Supply Unit	2 ea	54"		38 1/2"		~74"
Tx/Amplitron Modulator Assembly	2 ea	54"		38 1/2"		~74"
Solid-State Receiver Cabinet	2 ea	36"		31 1/2"		~74"
Tx/Rx Voltage Regulator	2 ea	23 1/2"		21"		~32"
Radar Set Control Cabinet	1 ea	-		-		-
RCIU	1 ea	22"		24"		24"
MIM	1 ea	24"		25 1/2"		81"
MIM Cable Junction Box	1 ea	-		-		-
Radar Display	2 ea	30"		40"		47"
Radar Cable Junction Box	2 ea	~48"		~10"		~54"
Azimuth Pulse Amplifier	1 ea	-		-		-
Azimuth Pulse Terminal Box	1 ea	-		-		-
Radar Antenna Starter Control Box	1 ea	-		-		-
Common Digitizer 1	1 ea	66"		29"		74"
CD 1 Display	1 ea	32 1/2"		50 1/2"		58"
CD 1 MODEM	1 ea	22"		24"		74"
Common Digitizer 2	2 ea	24"		28"		74"
CD 2 Display	1 ea	30"		50"		74"
MODEM	1 ea	24"		31"		74"
Site Spares (ARSR-1e, CD I, CD II, MODEM's, etc.)	All onsite.					
Cabinet Interconnecting Cables, Grounds, etc.	All, to be removed entirely.					
Waveguide Compressor Unit w/controls, plumbing, w/cabling, etc.	1 ea					
Waveguide run, w/Associated Components (Dummy Loads, Waveguide Switches, Isolators, Couplers, Supports,						

LEAPFROG TYPICAL ARSR-1/2
SITE EQUIPMENT DIMENSIONS (Cont'd)

Waveguide run (Cont'd)

Hangers, Misc. Hardware, etc.	All, to be removed entirely from transmitter/receiver cabinets to the antenna rotary joint.		
Tx Coolant System (Compressor/Pumps/ Plumbing/Controls) for Magnetron/ Amplitron/Load Isolators	2 ea	(A & B channels)	
Radar Antenna: W/Feedhorn Assembly, ARSR/CP-LP/ATCRBS (NADIF), Waveguide	1 ea		
Rotary Joint	1 ea		
Reflector	1 ea		
Reflector Support	1 ea		
Drive Motors	2 ea		
Azimuth Data Generator Assembly	2 ea		
Antenna Pedestal	1 ea		
Hoist & Rail Assembly	1 ea		
Spare Parts	All onsite.		
ATCRBS RF Antenna Cable	All, to be removed entirely.		
Radar Antenna Tower: Rigid Structure Dome	1 ea		
Waveguide, with Associated Waveguide Components, Waveguide Switches, Isolators, Couplers, Hangers, Misc. Hardware, etc.	All, to be removed entirely.		
Antenna Control Boxes assoc. hardware	1 ea	~24"	~24" ~6"
Antenna/Door Safety Switch w/mounting hardware	1 ea		
ATCRBS RF Antenna Cable, supports, hangers, misc. hardware, etc.	All, to be removed entirely, from the rotary joint to the tx/rx couplers.		

LEAPFROG TYPICAL ARSR-1/2
SITE EQUIPMENT DIMENSIONS (Cont'd)

Radar Antenna Tower:

Lightening &
 grounding system,
 Lighting and
 Electrical circuitry-
 switches, controls,
 receptacles, and
 assoc. mounting
 hardware

All, to be removed entirely.

Tower structure
 (members)

Site dependent

Test Equipment:

Transmitter Test Set

1 ea	30"	30"	30"
------	-----	-----	-----

Other:

Transmitter Coolant
 Compressor/Chiller
 System, raised
 galvanized steel

approx 8' above ground

1 ea	~8'	~10'	3'
------	-----	------	----

Evaporator Units

2 ea

Coolant pumps

2 ea

FIGURE 3-15. LEAPFROG TYPICAL ARSR-1/2 SITE EQUIPMENT
NOT TO BE REMOVED NOR REPLACED

ARSR Equipment Room:

Power Distribution Panel - Main Circuit Breakers for the ARSR-1 and other equipment, therefore it is not to be removed.

MODEM - Required for remoting data to FAA, Navy, and the USAF.

RCL Racks (2) and assoc. equipment, required for continued use, not to be removed.

Terminal Microwave Link Repeater (TMLR) A & B Racks, Back Up Emergency Communications (BUEC), and Weather Digitizer - Required for continued use, not to be removed.

ATCBI-5 System, with RF Test Set and ISM. Required for continued use.

VOT - Required for continued use, not to be removed.

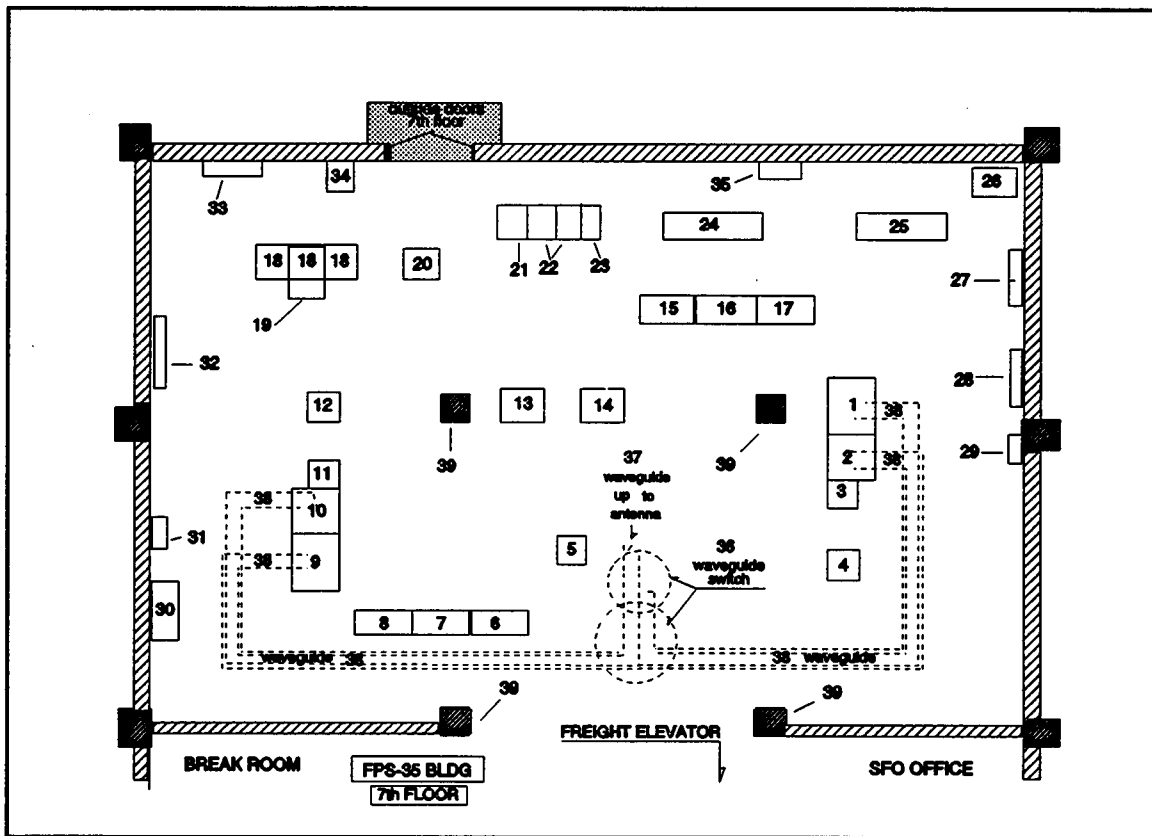
Other:

Air Conditioner Units.

Antenna Tower Winch/Hoist - The hoist/winch with mounting brackets, hardware, etc. will remain as part of the ARSR-1 antenna tower.

Cable Trays/Square D Ducts - This equipment is considered miscellaneous hardware and is required to remain in place so as not to disturb operation of the remaining support systems.

Engine/Generator - The 120 KW engine/generator, typically located within the building adjacent to the Tx/Rx/equipment room may be continued in use, since Leapfrog of the engine/generator is dependent on donor site requirements.

FIGURE 3-16. FPS-67b TYPICAL EQUIPMENT LAYOUT**Key:**

- | | |
|-------------------------------|--------------------------------|
| 1 - Ch A TX Klystron PA Cab | 19 - CD II Display |
| 2 - Chan A TX IPA Cabinet | 20 - MODEM Rack |
| 3 - Ch A TX Buffer Mixer Cab | 21 - ATCBI RF Test Set Rack |
| 4 - Chan A Control Cabinet | 22 - ATCBI System, Chan A & B |
| 5 - Chan A Ant Chan Cont Cab | 23 - ATCBI ISM Rack |
| 6 - Chan B PDP Cabinet | 24 - BUEC Rack |
| 7 - Chan B TX PS Cabinet | 25 - RCL |
| 8 - Chan B TX Pulse Gen | 26 - RCL Battery Bank |
| 9 - Chan B TX Klystron PA Cab | 27 - PDP-BUEC, RCL, etc. |
| 10 - Chan B TX IPA Cabinet | 28 - RCJB-Ant Syncho Data only |
| 11 - Chan B TX Buff Mixer Cab | 29 - RCL RCJB-1 Chan only |
| 12 - Chan B Control Cabinet | 30 - Mini D-Marc |
| 13 - Chan B SS Receiver Cab | 31 - Telco Junction Box |
| 14 - Chan A SS Receiver Cab | 32 - PDP-ATCBI & CD II |
| 15 - Chan A PDP Cabinet | 33 - CDJB |
| 16 - Chan A TX PS Cabinet | 34 - RCIU |
| 17 - Chan A Pulse Generator | 35 - RRWDSJB |
| 18 - Common Digitizer II | |

**FIGURE 3-17. LEAPFROG TYPICAL FPS-67b
EQUIPMENT TO BE REPLACED AND REMOVED**

<u>ITEM</u>	<u>QTY</u>	<u>LOCATION</u>
FPS-67b Equipment Room:		
Tx Klystron PA Cabinet	2 ea	A & B channels
Tx IPA Cabinet	2 ea	A & B channels
Tx Power Distribution Cabinet	2 ea	A & B channels
Tx Power Supply	2 ea	A & B channels
Tx Pulse Generator	2 ea	A & B channels
Buffer Mixer Cabinet	2 ea	A & B channels
Solid-State Receiver Cabinets	2 ea	A & B channels
Radar Channel Control Cabinet	2 ea	A & B channels
Radar Antenna Control Cabinet	1 ea	
Waveguide Air Compressor Unit w/controls, plumbing/ cabling, etc.	2 ea	A & B channels
Tx Coolant System (Compressor/Pumps/Plumbing/ Controls) for Klystron/ Load Isolators	2 ea	A & B channels
Common Digitizer II	1 ea	
CD II Display	1 ea	
Remote Control Interface Unit	1 ea	
Radar Cable Junction Box for Synchro Data	1 ea	
Common Digitizer Cable Junction Box	1 ea	
Site Spares (FPS-67b, CD II, MODEM's, etc.)	All onsite.	
Cabinet Interconnecting Cables, Grounds, etc.	All, to be removed entirely	
Associated Waveguide Components:		Antenna Tower
Dummy Loads, Waveguide Switches, Isolators, Couplers, Filters, Miscellaneous Hangers, Hardware, etc.	All, to be removed entirely	

LEAPFROG TYPICAL FPS-67b EQUIPMENT
TO BE REPLACED and REMOVED (Cont'd)

<u>ITEM</u>	<u>QTY</u>	<u>LOCATION</u>
Waveguide Run:		Antenna Tower
(from transmitter/ receiver cabinets to the antenna rotary joint),	1 ea	Antenna Tower
Including Hangers and Associated Hardware	All, to be removed entirely.	
 Radar Antenna:		Antenna Tower
Feedhorn Assembly,	1 ea	
FPS/CP-LP/ATCRBS (RIVDIF)	1 ea	
Reflector	1 ea	
Reflector Support	1 ea	
Antenna Pedestal	1 ea	
Rotary Joint	1 ea	
Drive Motor	1 ea	
Azimuth Pulse Generator Assembly	2 ea	
Hoist & Rail Assembly	1 ea	
Spare Parts	All on site.	
Associated Waveguide Components, Hangers, Pressurizing accessories, Misc. Hardware, etc.	All, to be removed entirely.	
ATCRBS RF Antenna Cable	All, to be removed entirely, from the antennas to the rotary joint.	
 Radar Antenna Tower:		
Rigid Structure Dome	1 ea	
Waveguide, with Associated Waveguide Components, Hangers, Misc Hardware, etc.	All, to be removed entirely.	
Antenna/Door Safety Switch w/Conduit, Wiring, etc	1 ea	
Antenna Junction Box w/Assoc. Hardware, Wiring, etc.	1 ea	
ATCRBS RF Antenna Cable, RG-214U	All, to be removed entirely, from the rotary joint to the tx/rx couplers.	
 Antenna/Door Safety Switch w/Conduit, Wiring, etc.	1 ea	

FIGURE 3-18. LEAPFROG TYPICAL FPS-67b SITE
EQUIPMENT DIMENSIONS

Radar Equipment Room:	Qty	Width	x	Depth	x	Height
Tx Klystron PA Cabinet	2 ea	50"		32"		74"
Tx IPA Cabinet	2 ea	30"		32"		74"
Tx Power Distribution Cabinet	2 ea	48"		31"		74"
Tx Power Supply	2 ea	48"		31"		74"
Tx Pulse Generator	2 ea	48"		31"		74"
Buffer Mixer Cabinet	2 ea	24"		24"		74"
Solid-State Receiver Cabinet	2 ea	36"		31"		74"
Radar Channel Control Cabinet	2 ea	26"		24"		74"
Radar Antenna Control Rack	1 ea	24"		26"		74"
Waveguide Pressurization Unit, w/air compressor, controls, plumbing/cabling, etc.	2 ea	~36"		~36"		~36"
Tx Chiller System (Compressor/Pumps/Plumbing/Controls) for the Klystrons & Load Isolators	2 ea	31 1/2"		33"		~48"
Common Digitizer II	1 ea	77 1/2"		26"		77"
CD II Display	1 ea	(p/o CD II above)				
RCIU	1 ea	~24"		~24"		~24"
Radar Cable Junction Box for Synchro Data	1 ea	~48"		~8"		~48"
Common Digitizer Cable Junction Box	1 ea	~24"		~10"		~24"
Other:						
Transmitter Coolant Compressor/Chiller	2 ea	~4'		~4'		~4'

FIGURE 19. LEAPFROG TYPICAL FPS-67b SITE EQUIPMENT
NOT TO BE REMOVED NOR REPLACED

Radar/Equipment Room:

Power Distribution Panel - Contains main circuit breakers for the BUEC, RCL, and other equipment, therefore, it is not to be removed.

RCL Racks (2) and associated equipment - required for continued use, not to be removed.

BUEC and Weather Digitizer - Required for continued use, not to be removed.

ATCBI-5 System, with Beacon Test Set and ISM - Required for continued use.

Other:

Air Conditioner Units:

Cable Trays/Square D Ducts - This equipment is considered miscellaneous hardware and is required to remain in place so as not to disturb operation of the remaining support systems.

Engine/Generator: The 175 KW engine/generator, located on the first floor of the building may be continued in use, since Leapfrog of the ARSR-3 125-kw E/G is dependent on donor site requirements.

32. SYSTEM REQUIREMENTS. The ARSR-3 system requirements (7 cabinets) for floor space and floor loading are considerably less than that required for the ARSR-1/2 (11 cabinets) and FPS-67b (17 cabinets). The existing ARSR-1/2 or FPS-67b facility AC primary power source is adequate in quantity to accommodate the ARSR-3 system and associated subsystems; however, to assure the quality of power required by the ARSR-3, a power conditioning source/uninterruptible power source (PCS/UPS) may be required at some Leapfrog receive sites. In some instances, additional power input distribution and circuit breakers may be required to offer proper operation of the equipment during installation and switch-over. At new installations, complete primary and standby AC resources will be required, either Leapfrogged or provided anew.

33. INTERFACES.

a. Onsite. The onsite interfaces to the ARSR-3 system include the ATRCBS antenna, weather digitizer, primary/standby AC power system, remote transmission equipment (MODEM, with RCL, telephone lines or landline/cables) and RMM equipment.

b. The Remote Interface. The remote interfaces are remote (landline) cables, communication narrow-band (telephone) landlines, or RCL for the digitized primary/secondary/weather radar video data and radar timing triggers. At newly established ARSR-3 sites, the TAC will provide site survey and installation procedures for remote systems (RML/RCL/MODEM/landlines/remote cables/RMM/repeaters sites, etc). Agency requirements will be determined by AF. Site requirements will then be established during the receive site survey. All equipment for the new installation will be GFE.

c. Remote Equipment Interface. RMM MODEM and Telco MODEM equipment.

34.-39. RESERVED.

CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. PROJECT SCHEDULES AND GENERAL STATUS.

a. Project Approval. The ARSR-3 Leapfrog project was approved in the 1990 Capital Investment Plan, as Project 44-39, Relocate Airoute Surveillance Radar (ARSR).

b. Procurement. A limited procurement will be required. Some receive sites will require a Beacon Test Set, RBPM/RSM equipment, miscellaneous waveguide, and power conditioning source (PCS)/Uninterruptible power source (UPS) equipment. Newly established sites will require engine/generators (E/G), fuel tanks, power distribution panels, grounding system, remoting subsystems, etc. All receive sites will require miscellaneous installation hardware, cable trays, cable fabrication, wiring, etc. Receive site specific requirements will be determined during the site survey. Installation materials will be provided by the TAC, while all equipment furnished will be GFE.

c. Project Activity Schedules. Commencement of the ARSR-3 Leapfrog project installation is dependent on the completion of the respective site survey, approval of the site engineering report (SER), issuance of the Notice-to-Proceed (NTP) and critically on the ARSR-4 deliveries and commissioning, thereby releasing the ARSR-3 assets to the Leapfrog program. The first Leapfrog ARSR-3 availability is scheduled for April, 1994.

41. MILESTONE SCHEDULE SUMMARY.

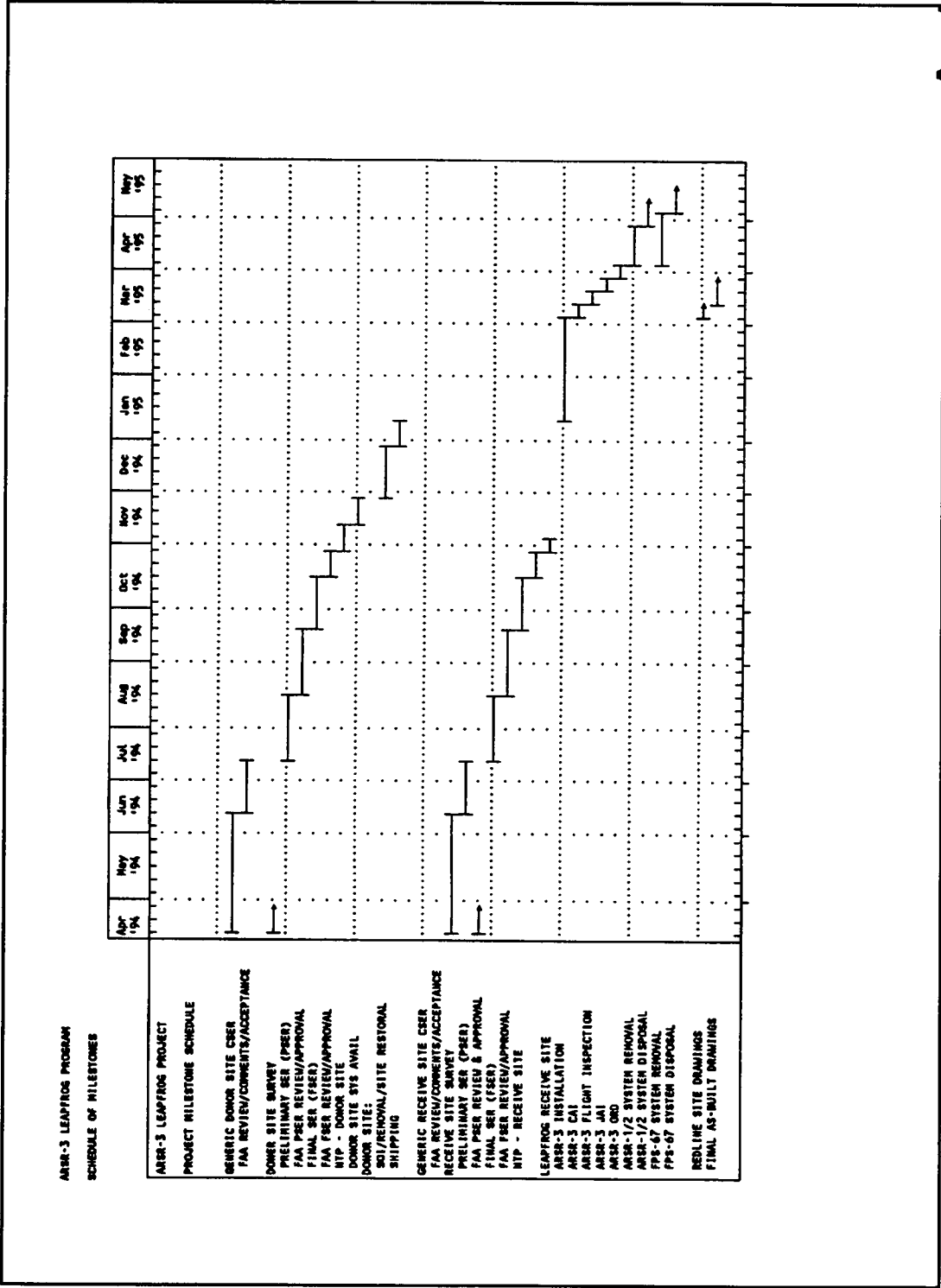
a. General. All phases of the ARSR-3 Leapfrog project will be coordinated with the regional TOR by the installation personnel. See figure 4-1, ARSR-3 Leapfrog Milestone Schedule.

b. Donor Site Survey. The donor site survey, the first step of the equipment relocation process, will be performed at least 120 days prior to system removal.

c. Receive Site Survey. The receive site survey, the first step of the field reinstallation process, will be performed at least 120 days prior to system installation.

d. Preliminary Donor Site SER. The preliminary donor site SER (detailed de-installation plan and procedures) will be developed as a result of the donor site survey.

FIGURE 4-1. ARSR-3 LEAPFROG MILESTONE SCHEDULE



e. Preliminary Receive Site SER. The preliminary receive site SER will be developed as a result of the receive site survey.

f. Final Donor Site SER. A final donor site SER will be developed by revising the preliminary donor site SER to reflect revisions per the FAA review, comments, and acceptance of the preliminary donor site SER.

g. Final Receive Site SER. A final receive site SER will be developed by revising the preliminary donor site SER to reflect revisions per the FAA review, comments, and acceptance of the preliminary site SER.

h. Notice-To-Proceed (NTP). The NTP will be issued within 15 days of receipt of the final SER by the RAPM.

i. System Availability. Availability of the ARSR-3 systems is dependent primarily on ARSR-4 installations and commissionings. ATC requirements, modification status, and environmental conditions may also impact on ARSR-3 availability.

j. SOI/System Removal. The ARSR-3 system and associated equipment will be available for SOI and removal within 10 days after the commissioning date of the ARSR-4 system. Equipment removal, including the antenna tower structure work and site restoration, will be completed within 6 weeks. The SOI/system removal will be considered complete when:

(1) The SOI has been successfully performed on the ARSR-3 system, applicable subsystems, and all its associated radar equipment.

(2) The ARSR-3 and associated equipment, specific spare parts, special tools, instruction manuals, modifications records for all equipment are disassembled, packed, and ready for transport.

(3) Site restoration is completed.

k. System Installation. Installation of the ARSR-3, and associated equipment and material will commence as soon as possible after receipt at the receive site. A Contractor Acceptance Inspection (CAI), to verify the acceptability of the site preparation, will be completed prior to commencement of the ARSR-3 installation. Equipment installation will be completed within 12 weeks. Radar frequency and PRF changes, if necessary, will be made during this step. The system and equipment will be

ready for testing and commissioning within 161 days after the receipt at the receive site.

l. Contractor Acceptance Inspection (CAI). The CAI will be the last step of the installation process preparatory to the flight inspection and should be performed within 2 weeks following the successful completion of the SOI.

m. Flight Inspection. A full flight inspection of the ARSR-3 and ATCRBS systems will be performed as required by AOS and the Region, augmented by the use of automated tools to prove that the system meets NAS requirements for airspace coverage, and should be performed within 2 weeks following the successful completion of the CAI.

n. Joint Acceptance Inspection (JAI). The JAI will be the final step of the installation process and should be performed within one week following the successful completion of the flight inspection.

o. Training. ARSR-3 training requirements will be determined by the AF sector with course(s) availability arranged by ASM-250 with the FAA Training Academy (AMA) to ensure completion of training requirements prior to the Leapfrog equipment installation to obviate delays in commissioning.

p. Provisioning. Leapfrog ARSR-3 system provisioning to meet the minimum level of the initial supply support allowance chart (ISSAC) required by NAS operational requirements, is the direct responsibility of the receive site AF sector office. However, the donor site will provide an inventory, a computer diskette, of available spares to be included with the shipment to the receive site.

q. Operational Readiness Demonstration (ORD). The ORD will be performed, as the final step of the operational testing and evaluation (OT&E) process. The ORD should be performed within 120 days following receipt of the Leapfrog equipment by the receive site.

r. Detailed Schedules. Detailed schedules applicable to the ARSR-3 LRR systems have been consolidated in appendix 2. Updates to this appendix will be issued to reflect program changes. Revisions which are necessary to meet changing requirements, or priorities, will be coordinated with cognizant regional AT and AF divisions and approved by the program manager (PM) prior to issuance.

s. Final Drawings. The TAC will prepare final as-built site construction and electrical drawings in accordance with standard FAA-STD-002, Facilities Engineering Drawing Preparation, for distribution to each respective region.

42. INTERDEPENDENCIES AND SEQUENCE. Implementation of the ARSR-3 Leapfrog system installations will be dependent on successful and timely installation, acceptance, and commissioning of the ARSR-4 systems, thereby releasing ARSR-3 systems for the Leapfrog project.

43. New Telecommunications Requirements. The ARSR-3 systems relocated to new sites not replacing existing ATCBI-1/2 systems will require new inter-facility telecommunications services for operation. Telecommunications requirements should be directed to the Telecommunications Management and Operations (TM&O) Division, ASM-300, which manages FAA telecommunications at the national and regional levels. ASM-300 will determine the general requirements and coordinate with the regional TM&O organizations to implement the networks and circuits required.

44.-49 RESERVED.

CHAPTER 5. PROJECT MANAGEMENT

50. Program Structure/Administration. The ARSR-3 Leapfrog project is under the auspices of the Program Director for Surveillance, ANR-1. The ARSR-3 Leapfrog Program Manager (PM) is ANR-400. ANR-400 has first line responsibility for the operational evaluation, removal, relocation, installation, and operational testing of the end product of the ARSR-3 Leapfrog project. The PM keeps the Administrator informed on project status, in accordance with Order 1810.1E, Major Acquisitions. Figure 5-1 shows the program management participants.

FIGURE 5-1. ARSR-3 LEAPFROG PROJECT MANAGEMENT STRUCTURE

Program Director ANR-1		
Program Manager ANR-400		
<u>Headquarters Associate Program Managers</u>	<u>Region Associate Program Managers</u>	<u>Other Associate Program Managers</u>
Associate Program Manager for ATC Procedures, ATP-130	Associate Program Manager for Central Region, ACE-425	Associate Program Manager for FAA Academy, AMA-442
Associate Program Manager for AT Plans & Rqmts Service, ATR-110	Associate Program Manager for Eastern Region, AEA-421.1	Associate Program Manager for FAA Logistics Center AML-200
Associate Program Manager for Engineering, ANR-140	Associate Program Manager for Great Lakes Region, AGL-421	
Associate Program Manager for General Counsel, AGC-510	Associate Program Manager for New England Region, ANE-422B	
Associate Program Manager for Logistics, ANS-420	Associate Program Manager for Northwest Mountain Region, ANM-422	
Associate Program Manager for Operational Sys, AOS-320	Associate Program Manager for Southern Region, ASO-422.2	
Associate Program Manager for Systems Engineering, ASE-320	Associate Program Manager for Southwest Region, ASW-422	
Associate Program Manager for Quality, ASU-421	Associate Program Manager for Western-Pacific Region, AWP-433.31	

b. Key Individuals. Key individuals and telephone numbers are listed in figure 5-2.

FIGURE 5-2. LEAPFROG PROJECT KEY INDIVIDUALS

Ref	Program Management	Office	Key Person	Telephone
A	Program Director	ANR-1	Carmine Premeggia	202 606-4531
B	Program Manager	ANR-400	Richard J. Lay	202 606-4461
C	PM's Secretary	ANR-300	Carolyn Berry	202 606-4627
D	Business Manager	ANR-300	Irene Langweil	202 606-4798
	HQ APM's			
E	Engineering	ANR-140	Dennis Kolb	202 606-4644
F	Contracts	ASU-421	Mark Palmer	410 993-9455
G	General Counsel	AGC-510	George Kinsey	202 267-3480
H	Logistics	ANS-420	Cynthia Schauland	202 267-8091
I	Sys Engineering	ASE-300	Douglas Hodgkins	202 646-4818
J	ATC Reqmts	ATR-320	John Timmerman	202 267-9191
K	AOS	AOS-320	Gerald Young	202 267-8525
L	ATC Procedures	ATP-130	Jim O'Malley	202 267-0326
M	Region APM's			
N	Central	ACE-425	Leland Riffel	816 426-5676
O	Eastern	AEA-432	Nayla Fouad	718 553-1176
P	Great Lakes	AGL-422.2	Jack Albrecht	312 694-7591
Q	Northwest Mountain	ANM-422.2	Darby Curran	206 227-2434
R	Southern	ASO-422	Tom Erwin	404 763-7677
S	Southwest	ASW-422	Larry Young	817 740-3493
T	Western Pacific	AWP-433.31	Bradford Gee	310 297-1078
	Other APM's			
U	Academy	AMA-442	Stewart Meyer	405 954-6465
W	Logistics Center	AML-200	Ed Andrews	405 954-7491
X	Regions			
Y	TOR			
Z	TAC			

NOTE: The Reference Column in Figure 5-2A Keys to the Reference Column in Figure 5-1.

FIGURE 5-2A. RESPONSIBILITIES

Primary Office(s)	Supporting Office(s)	Task/Plan/Activity Responsibility
A	ALL	Project Management and Control
E,Z	ALL	NAS Implementation of the ARSR-3 Leapfrog Sys
E	Z	Financial Management
U,X,AF Sector	E,X, AHT	Maintenance Training
E,Z	ALL	Technical (overall)
K,X,Z,ASM-100	Z,ASM-100,300	Technical (Field)
E,F,H	ASM-100	Logistic Support
X,Z	E,Z	Site Preparation
AF SECTOR	E,X,ASM-250	Maintenance Staffing
B,ANA-140	X,Z,ACT	RMS
X,Z	E,X	Site Survey and Site Engineering Report
Y,Z	E	Donor Site SOI/Equipment Removal/Shipment
X,Z	E,X	Installation of ARSR-3
X,Y,Z,ACN-200	E,X,AT	Acceptance Tests (SOI/CAI/ORD)
X	E,Z	Flight Inspection
X,Y,Z,ACN-200	E	Joint Acceptance Inspection (JAI)
Y	E	Record Form FRDF
H,X,Z	E,X	Removal/Disposal of ARSR-1/2

51. PROJECT COORDINATION AND SUPPORT. The following subparagraphs provide a brief overview of program support groups which assist the PM in managing all aspects of the program:

a. Headquarters Associate Program Managers. The associate program managers provide required support to the PM within their areas of responsibility.

b. Regional Associate Program Managers. These associate program managers serve as focal points in their respective regions for all the ARSR-3 Leapfrog system implementation activities. As the PM's regional representatives, they work closely with the PM and the APME (TO). They are designated by the regional AF division manager, appointed by the PM, and are accountable for ensuring that the ARSR-3 Leapfrog project is implemented in an orderly manner. The associate program manager's tasks include, but are not limited to, the following:

- (1) Coordinate/manage regional deployment activities.
- (2) Provide guidance and direction to the FAA site personnel.
- (3) Provide input and periodic technical reports describing the deployment progress at each site to the TO.
- (4) Coordinate with the appropriate AT regional and site representatives per established regional policy, for test activities which would interfere with ATC operations.
- (5) Notify the PM of JAI readiness and conduct integration of the ARSR-3 system into the NAS (reference Order 6030.45, Facility Reference Data File) and ensure that the AF sector manager, or appropriate representatives, are present.
- (6) Review and approve the SER.

c. TOR. A TOR, designated for each site by the appropriate AF division manager, is appointed by the PM. This position is the interface between the F&E/contractor, AF sector, and AT personnel. Tasks include, but are not limited to, the following:

- (1) Arranging for contractor site access.
- (2) Providing inputs to logistics planning activities as they relate to site requirements.
- (3) Assisting the contractor during site surveys.

(4) Providing assistance in direction and guidance to the contractor to efficiently accomplish site preparation, installation, testing, and evaluation for the ARSR-3 LRR System.

(5) Performing the donor site SOI prior to beginning the equipment removal for Leapfrog relocation.

(6) Witnessing the site preparation, installation, and testing.

(7) Participating in shakedown testing and integration of the Leapfrog system into NAS.

(8) Completing the FAA Form 256, Inspection Report of Material or Services, for the ARSR-3 system.

(9) Assisting in system field testing in accordance with the requirements of the test plans for the ARSR-3 system.

(10) Participating in the JAI.

(11) Maintaining installation logs and submitting installation status reports, based on log entries, to the TO.

52. PROJECT MANAGERIAL COMMUNICATIONS. To maintain effective and responsible control of overall ARSR-3 Leapfrog project progress, reviews, conferences, and working sessions will be held among the PM's, associate program managers, TO's, TOR's, and the contractor. Participation in these conferences and working groups by various FAA offices will be requested at the discretion of the PM. In addition, routine status reports will be required.

53. IMPLEMENTATION STAFFING. The following personnel are responsible for the implementation of the ARSR-3 Leapfrog project.

a. PM. The Program Director for Surveillance (ANR-1), has designated ANR-400 to serve as PM for the ARSR-3 Leapfrog project.

b. TO. The PM has designated a member of ANR-140 as TO for the ARSR-3 Leapfrog project.

c. Regional Associate Program Manager. The associate program manager serves as a focal point for all regional ARSR-3 Leapfrog project activities, including site preparation.

d. TOR. The TOR coordinates communication in support of the TO. The TOR will submit weekly technical reports to the TO describing the progress of each site within the region. The TOR will notify the TO, directly by phone, of any incident, or problem, which causes an interruption of facility service, or delay of installation activity. The problem will be reported as soon as convenient to do so following occurrence.

54. PLANNING AND REPORTS. The implementation of the ARSR-3 Leapfrog project will be monitored by the use of the following:

a. Program Status Reviews. The PM will periodically apprise higher level management of the status of program schedules, cost information, and technical topics. The PM may request the support of functional or contractor organizations in providing status and information on specific program topics.

b. Contractor Progress Reports. Where contractors are authorized, the contractor will apprise the RAPM on a monthly basis of their assessment of contractual effort, work scheduled for the next period, and any special problem areas, including proposed solutions.

c. Implementation Working Group. This group will meet periodically at the FAA headquarters in Washington, DC, or other agreed to locations to address both program issues and specific functional activities. Membership consists of the PM and the headquarters TO. Other offices will be asked to participate as required.

d. TOR. TOR conferences will be scheduled as necessary, attended by the TOR from each region, the TO and representatives from headquarters organizations. The conferences provide a forum to discuss and resolve program issues of special interest common to the regions.

e. Regional Status Reporting. Weekly status reports will be submitted by each TOR to the respective RAPM for distribution, as appropriate. Responses to specific issues and requests will also be addressed in these reports.

f. Installation Phase Documentation. The basic documentation required are the installation log and weekly installation status reports (described above). The installation log is described as follows:

(1) Installation Log. The TOR will maintain a project log and make entries documenting the installation status, activities and events for each site. Entries will be made for visits

the site, communications, coordination, and other pertinent information having an impact on the installation progress. Items of consequence not adequately covered by written documents shall be included in the log (e.g., unusual physical conditions encountered, oral protests, design deficiencies noted and actions taken, cause and extent of delays, etc.). The complete and factual entries will be made at the time of occurrence. Upon completion of the contracted work, the TOR will forward the log through the RAPM to the TO.

55. APPLICABLE DOCUMENTS.

a. FAA Orders.

1000.1A	Policy Statement of the Federal Aviation Administration
1100.1A	FAA Organization - Policies and Standards
1100.2C	FAA Organization - FAA Headquarters
1100.5B	FAA Organization - Field
1800.8E	National Airspace System Configuration Management
1800.13C	Planning and Resource Allocation
1800.63	NAS Deployment Readiness Review
1810.1E	Major Acquisitions
1810.4B	FAA NAS Test and Evaluation Program
4250.9B	Field Material Management and Control
4650.7A	Management of Project Material
4800.2B	Utilization and Disposal of Excess and Surplus Property
6000.30B	Policy for Maintenance of the NAS Through the Year 2000
6030.45	Facility Reference Data File
WA 6090.1	Development and Implementation of RMS within the National Airspace System (NAS)
6300.13	Radar System Optimization and Flight Inspection Handbook
6340.1	Radar Facilities and Equipment Modification Handbook - Long Range Surveillance
6340.13A	Maintenance of Air Route Surveillance Radar, ARSR-3 Facilities
AF 6360.1	Radar Facilities and Equipment Modification Handbook, Radar Beacon
6360.1B	Maintenance of Air Traffic Control Beacon Interrogator, ATCBI (except ATCBI-5)

5/3/93

6340.25

6360.6	Interface Instruction for Air Traffic Control Beacon Interrogator, ATCBI-4
6360.7A	Air Traffic Control Radar Beacon System, Standard Drawings
6360.13	Air Traffic Control Radar Beacon System (ATCRBS)
6360.14A	Maintenance of Air Traffic Control Beacon Interrogator Equipment, ATCBI-5

b. FAA Standards.

FAA-STD-002C	Facilities Engineering Drawing Preparation
FAA-STD-019B	Lightening Protection, Grounding, Bonding, and Shielding Requirements for Facilities.

c. FAA SPECIFICATIONS.

NAS-SS-1000	Volume 1, Appendix II, Functional and Performance Requirements for the National Airspace System, General
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d. FAA Forms.

256	Inspection Report of Material or Services
6030.18	Joint Acceptance Inspection (JAI)
6030.19	"
6030.20	"
6030.21	"
6030.22	"
6030.23	"
6030.24	"
6030.25	"

56.-59. RESERVED

CHAPTER 6. PROJECT FUNDING

60. PROJECT FUNDING STATUS, GENERAL. Funding requirement for the Leapfrog relocation was identified through the CIP process as project 44-39 of the Capital Investment Plan, dated December 1990. Actual funding levels will be determined through the agency's budget submission and Congressional action.

61. PROJECT FUNDING STATUS, REGIONS. Regions will be provided additional funds as required, when requested by the region, based on justification.

62. PROJECT FUNDING STATUS, AERONAUTICAL CENTER. The Aeronautical Center will be provided additional funds as required, when requested by the Aeronautical Center, based on justification.

63.-69. RESERVED.

CHAPTER 7. DEPLOYMENT

70. GENERAL DEPLOYMENT ASPECTS. Site engineer reports will be developed for each donor/receive site, respectively, based on the findings of the site surveys. A donor site ARSR-3 SOI will be performed, to verify that the system meets operational tolerances immediately prior to system shutdown and removal. The ARSR-3 system will then be dismantled and removed, along with it's associated subsystems and equipment and shipped to the receive site. The antenna tower, radome, and antenna pedestal/drive system will be depot refurbished as necessary. At the receive site, reinstallation of the ARSR-3 system, including the antenna with RF plumbing, radome, antenna tower, the ATCRBS system where required, radar beacon performance monitor (RBPM/RSM) and Beacon Test Set where required, associated equipment; testing and optimization of the ARSR-3 system; removal and disposal of the ARSR-1, 2, or FPS-67b system and associated equipment; and preparation and delivery of as-built site drawings. The TOR will perform all site coordination between the contractor and FAA.

71. Specific Deployment Tasks. The deployment schedule of donor/receive sites for the ARSR-3 Leapfrog project is shown in appendix 2, figure 1. The deployment tasks are outlined as follows:

a. Site Preparation. Physical site preparation requirements will be minimal, except for the newly established sites, where site preparation will be performed under separate regional contracts. Site specific requirements will be detailed in the SER.

(1) Donor Site. Preparation of the donor site for removal of the ARSR-3 system will be in accordance with the SER. The FAA will provide the necessary site support to enable the contractor to effect the removal of the ARSR-3 Leapfrog equipment. The contractor will restore the facility, after equipment removal, per SER requirements.

(2) Receive Site. The receive site installations will utilize existing FAA/Government facilities or property, such as buildings, communication link (RML/RCL) systems, MODEMS, RML/RCL repeater towers, remote land lines, equipment rooms, control towers, and other facilities as specified in the SER.

(3) Newly Established Receive Sites. For the newly established sites, all structures, except the ARSR-3 antenna tower, environmental facilities, commercial power, utilities, and telecommunications will be provided by separate contracts and will be considered as existing facilities. However, the

facilities provided should meet the requirements as specified in the SER.

b. Deployment Tasks.

(1) Donor Site Survey. The first step of the field equipment relocation process. The site survey will determine detailed requirements necessary to effect the relocation, inventory of the equipment, spares, manuals, modifications involved, ATC impact, accessibility, manpower, and facility restoration. Site surveys will be performed in a timely sequence to permit current data inclusion in the SER and to allow an even flow of project activities.

(2) Receive Site Survey. The first step of the field reinstallation process. The site survey will determine detailed requirements necessary to effect the installation, space availability, interface assets, ATC impact, accessibility, manpower and training requirements, inventory of the equipment to removed, procedures for removal and facility restoration. Surveys will be performed in a timely sequence to permit an even flow of the following activities and will serve as the basis for the development of the SER.

(3) Preliminary Donor SER. The preliminary donor site SER (de-installation plan and procedures) will be developed as a result of the donor site survey. The SER will list all assets, including modification status, and any site, interface or project deficiencies, and potential problems of the Leapfrog equipment. The SER will include all plans, procedures, and directives detailed necessary to cover all aspects of the testing, inventory, removal, and transportation of the ARSR-3 system by trained technicians and engineers to efficiently and correctly effect relocation of the system. The SER will be distributed to the FAA for review, comments, and approval. The RAPM will have at least 30 days to respond with comments and/or approval.

(4) Preliminary Receive SER. The preliminary receive site SER will be developed as a result of the receive site survey. The SER will list site, interface or project deficiencies, and potential installation or access problems that will interfere with or delay the system installation. The SER will include all plans, procedures, and directives detailed necessary to cover all aspects of the testing, inventory, removal, and transportation of the ARSR-3 system by trained technicians and engineers to efficiently and correctly effect relocation of the system and initiate its operation into the NAS. The SER will include a full set of JAI Forms. The SER will include a full set of site drawings covering any and all wiring,

cable, equipment, and structural changes of the installation. The preliminary SER, with drawings, will be distributed to the FAA for review, comments, and approval. The RAPM will have at least 30 days to respond with comments and/or approval.

(5) Final Donor SER. The contractor will have a maximum of 30 days from date of receipt of comments to develop a final SER. The final donor site SER will be developed by revising the preliminary donor site SER to reflect the revisions per the FAA review, comments and acceptance of the preliminary donor site SER. The final SER will be submitted to the RAPM for approval and acceptance and will serve as the basis for issuance of the NTP.

(6) Final Receive SER. The contractor will have a maximum of 30 days from date of receipt of comments to develop a final SER. The final receive SER will be developed by revising the preliminary receive site SER to reflect the results of the FAA review, comments, and acceptance of the preliminary receive SER. The final SER will be submitted to RAPM for approval and acceptance and will serve as the basis for issuance of the NTP.

(7) NTP. The NTP will be issued, by the RAPM, within 15 days from date of receipt of the final SER. The NTP will be the authority for the TAC to begin the equipment relocation process at the donor site and site preparation and equipment installation process at the receive site, respectively. Copies of the NTP will be forwarded to the PM, COTR, and the Contracts Offices.

(8) Donor Site SOI. There will be an SOI of the donor site ARSR-3 prior to shut-down of the system for removal. The SOI will be performed by the FAA/TOR and witnessed by the TAC, to ensure that the system meets operational tolerances, per Order 6340.13, ARSR-3 Systems Optimization and Airway Facility Flight Inspection Handbook.

(9) Donor Site System Removal. System removal will be in strict adherence to the donor site final SER for each site:

(a) Removal of the ARSR-3 system, from the donor site, will include the ARSR-3 system; antenna; RF plumbing and associated hardware; antenna pedestal; drive motors; rotary joint; azimuth data generation units; radome; antenna tower; drive motors control boxes; antenna polarization control box; antenna tower door interlock/safety switch with locks, keys, and associated hardware; associated subsystems; voltage regulators; instruction manuals; modifications records; standby power E/G's; fuel tanks, if applicable and accessories; control boxes; power

panels with circuit breakers; system specific test equipment; transmitter coolant system and equipment; transmitter room air conditioning systems; system specific spare parts; special tools; and test equipment (Card Reader).

(b) For donor sites that are receiving Mode S beacon systems, the ATCRBS with antenna, RF antenna cables, and associated subsystems, hardware, instruction manuals, RBPM and remote system monitor with antenna and RF beacon test set, as required, RMM, associated spares, test equipment, and modification records for all equipment will be removed and Leapfrogged with the ARSR-3.

(c) Subcontracts for crane operators and qualified crew to remove the ARSR and ATCRBS antennas, pedestal, drive motors, radome, and tower will be the responsibility of the installation contractor.

(10) Packing and Transport. The ARSR/ATCRBS antennas, pedestal, rotary joint, radome, and antenna tower structural steel will be crated, as necessary, and shipped via lowboy flat-bed truck to the TAC depot for refurbishment. The remainder equipment noted in subparagraph 71.b(9)(a) will be packed for transport via padded van, or shipment via moving van, to the receive site.

(11) Installation. The system installation plan is detailed in the receive site SER, specifically for each site. Installation of the ARSR-3 and associated subsystems will be in strict adherence to the SER to assure system configuration uniformity. Installation, SOI, and CAI testing are the responsibilities of the contractor. The contractor will schedule, coordinate, and staff the efforts required for expeditious completion of the installation with ABSOLUTE MINIMUM DISRUPTION to on-going ATC operations and the surrounding area. Subcontracting for a crane adequate to install the ARSR-3 tower, pedestal, drive motors, and ARSR-3/ATCRBS antennas will be the responsibility of the installation contractor. Once started, it is expected that installation and testing will be accomplished within 133 days including installation of the antenna tower and radome. Coordination with the regions on the installation plan/schedules will be accomplished by the program office. The entire effort will be under the management control of the PM with assistance from associate program managers, other regional, and site representatives. All contractor onsite activity will be coordinated with the TOR, who will witness and certify the acceptability of each installation. Procedures for routine progress reporting will be established by the PM with input from the TOR and item managers. ANR-140 will advise the regions on

disposition of the ARSR-1/2 or FPS-67b equipment displaced by the ARSR-3 Leapfrog installation.

(a) At the receive site, install the ARSR-3 system, ARSR-3/ATCRBS antenna and RF cables, pedestal, drive motors, azimuth data generation units, antenna tower with RF plumbing and associated hardware, radome, antenna tower door interlock/safety switch with locks, keys, and associated hardware, lighting equipment, lightning rods and grounding system per FAA-Std-019b, Lightning Protection, Grounding, Bonding and Shielding Requirements for Facilities, associated subsystems, standby power system, fuel tanks, and accessories as required, control boxes, power panels w/circuit breakers, voltage regulators and system specific test equipment. Any required frequency or PRF changes will be set in at this time. Available modifications applicable to the ARSR-3 and associated electronic equipment will be installed, as required.

(b) Remove the ARSR-1/2 or FPS-67 from operation, dismantle, and dispose of per FAA instructions at that time. The solid-state receiver equipment, the common digitizer equipment, including displays, spares, instructions manuals, etc. will be returned to the FAA Logistics Center stock. The sequence of activity may be varied to satisfy site requirements.

(c) Install the ATCRBS and RF cables, associated subsystems, hardware, and RF beacon test set, if not already installed for that site, and available modifications for all equipment.

Note: Steps (d), (e), (f), and (g) apply to newly established sites only.

(d) The ISM and RSM are not required for commissioning the ATCRBS equipment, therefore the RBPM will be set in place **only, not connected**; the RSM, with antenna, will be left in its packing box at the LRR receive site.

(e) Install the RMM.

(f) Install the AC input power source and substation and the facility grounding and bonding system per FAA-Std-019b, as required and identified in the SER.

(g) Install the E/G standby power system and auxiliary equipment per site requirements as identified in the SER.

(12) Receive Site SOI. The TAC will perform the SOI,

witnessed by the TOR, to ensure that after installation the ARSR-3 and the ATCBI-4/5 Interrogator System meets or exceeds minimum initial tolerances, as specified in Orders AF 6340.13A and 6360.1B or 6360.14A, as applicable.

(13) Contractor Acceptance Inspection (CAI). The CAI will ensure that the technical and operational requirements of the SER has been complied with. The TAC will perform the CAI, which will be witnessed by the regional TOR.

(14) Final Site Drawings. The TAC will prepare final as-built site construction and electrical drawings in D size vellum and on Auto-Trol tape, per standard FAA-STD-002, Facilities Engineering Drawing Preparation, for distribution to each respective region. One copy of the red-lined as-built drawings will be left with the receive site.

(15) Training. All technical training requirements will be determined by the AF Sector. Training courses availability will be arranged by ASM-250 with AMA, as necessary, to facilitate completion of training requirements prior to the Leapfrog equipment installation to obviate delays in commissioning.

(16) Contractor Support. The TAC will provide all manpower, material, and equipment required to lift and move complete ARSR-3, ARSR-1/2 or FPS-67b system cabinets within, into and out of, the donor and receive facilities.

(17) Flight Inspection. The flight inspection is to prove acceptable system air space coverage. A flight check will be performed, augmented by the use of automated tools, as required by AOS and the region. The TAC will assist with the flight inspection as required.

(18) Joint Acceptance Inspection (JAI). The JAI is to prove satisfactory operational performance of the equipment and that all contractual requirements for installation have been satisfied and the equipment is ready to be commissioned. The JAI will be jointly performed by the FAA and TAC, and will be conducted in accordance with Order 6330.45, Facility Reference Data File. JAI documentation is comprised of FAA Forms 6030.18 through 6030.25 and the data contained therein. A copy of the results of the JAI will be forwarded through the RAPM to the TO for submission to the PM.

(19) Operational Readiness Demonstration (ORD). The ORD is the exercising, testing, and evaluation (T&E) of the system in an operational environment to support the determination

that the system is ready for full operation as part of the NAS. This includes T&E to confirm that, when the system is operated and maintained by operational personnel, in an operational environment, all requirements are met. ORD should reflect the operational readiness of the people, procedures, and the system to assume field operational status, and will be performed by the FAA.

(20) Provisioning. Leapfrog ARSR-3 system provisioning to meet the minimum level of the ISSAC required by NAS, is the direct responsibility of the receive site AF sector office. However, the donor site will provide an inventory, a computer diskette, of available spares to be included with the shipment to the receive site.

72. HARDWARE DELIVERY. In strict adherence to the SER, the contractor will go to the donor site for removal, packing, and transport/shipping the ARSR-3 system and associated equipment to the receive site or to the refurbishment depot as necessary. The contractor will provide all installation hardware, material and required personnel at each ARSR-3 donor and receive site, as appropriate. The donor site equipment and materials will be shipped/transported to each receive site for installation in accordance with times detailed in the approved SER and Leapfrog Deployment Schedules, appendix 2, figures 1. The Leapfrog sites distributive data are shown in figures 3-1 through 3-3.

73. INSTALLATION PLAN.

a. The installation plan will be specified in detail in the SER. The entire effort will be under the management control of the PM with assistance from associate program managers, other regional, and site representatives. Upon completion, the TOR will witness and certify the acceptability of each installation. Procedures for routine progress reporting will be established by the PM with input from the TOR and item managers. ANR-400 will advise the regions on disposition of ARSR-1/2 or FPS-67b equipment displaced by the Leapfrog of the ARSR-3 systems.

b. The SER will specify in detail the evaluation and test plan for each site, with schedules for accomplishing each phase of the work. Installation and checkout/testing of the ARSR-3 system to operational tolerances, per Order 6340.13, is the responsibility of the TAC. Regional facility drawings of each site are to be furnished to the contractor, prior to or during the site survey, to aid in the preparation of the SER and final as-built site drawings. Coordination with the regions on the installation plan/schedules will be accomplished by the program office. Review by the cognizant regional AT and AF divisions

shall be accomplished as expeditiously as possible. The plan (SER) will contain all necessary information required by trained technicians and engineers to correctly install the equipment and initiate its operation. Included will be step-by-step procedures for dismantle, removal, packing, storage, if necessary, transportation, unpacking, installing, and testing the ARSR-3 long range radar system and its supporting equipment. Preliminary D-size site construction drawings will be provided with the preliminary receive site SER to facilitate equipment installation. As the last item of the installation, these construction, and electrical site drawings will be updated (red-lined) to provide final as-built D-size vellum drawings, plus one copy of Auto-Trol tape, per FAA-Std-002 to each respective regional office. One copy of the red-lined drawings will be left at the receive site. In summary, all activities of the installation effort will be described in detail in the SER.

c. The contractor will schedule, coordinate, and staff the efforts required for expeditious completion of the installation with ABSOLUTE MINIMUM DISRUPTION to ongoing FAA ATC operations and its surrounding activity. Once started, it is imperative that onsite installation and testing be accomplished as judiciously as possible WITH MINIMUM ATC RADAR SERVICE OUTAGE time. The installation is expected to be completed within 91 calendar days. All activities of the contractor, from removal of the donor site equipment through installation, checkout, and acceptance, will be coordinated with the onsite TOR.

d. The contractor will contact the donor and receive sites TOR's immediately prior to the scheduled removal of the donor site equipment, to confirm that the Leapfrog sites are ready for equipment removal and installation.

74.-79. RESERVED.

CHAPTER 8. VERIFICATION

80. SYSTEM OPERATIONAL INSPECTION (SOI). Upon completion of the ARSR-3 installation, tune up, and adjustment, the TAC will then conduct the SOI, witnessed by the TOR, to verify that the ARSR-3 system meets initial tolerances as established by Order 6340.13A. Upon successful completion of the SOI, then proceed to the Contractor Acceptance Inspection.

81. CONTRACTOR ACCEPTANCE INSPECTION (CAI). The TAC will demonstrate to the FAA that the system has met all technical and functional requirements of ARSR-3 and the NAS, per Order 6340.13. Satisfactory completion of these tests designates acceptance of the equipment by the FAA. At this time, the TOR should prepare the FAA Form 256, Inspection Report of Material or Services and proceed to the flight inspection step.

82. FLIGHT INSPECTION. The ARSR-3 and the ATCRBS systems will require a full flight check to prove that the systems' air space coverage satisfy the established requirements for operation within the NAS. FAA will perform the flight inspection, augmented by the use of automated tools, as required by AOS and the region, assisted by the TAC, as requested.

83. JOINT ACCEPTANCE INSPECTION (JAI). A JAI will be conducted in accordance with Order 6030.45, Facility Reference Data File. The JAI is to ensure that each ARSR-3 system meets specified FAA requirements for operation and maintenance and is ready to be commissioned. The JAI shall include representatives from AT, AF, and the regional offices, and may include representatives from other organizations as appropriate. A copy of the results of the JAI will be forwarded to the TO for submission to the PM. The JAI documentation is comprised of FAA Forms 6030.18 through 6030.25, included as an appendix of the SER. The ARSR-3 system will be designated to be operationally certified upon the satisfactory completion of the JAI. The ARSR-3 can then be commissioned in test status while the operational readiness demonstration is being completed.

84. OPERATIONAL READINESS DEMONSTRATION (ORD). ORD, as the final stage of the OT&E, will be performed on the long-range radar facility, including optimization/integration and check-out of the ARSR-3 LRR system, the ATCRBS system, the remoting system and all other interface equipment/subsystems affected by the installation, testing, and commissioning effected by this order. The ORD will be the responsibility of regional personnel or their designated representatives. The ORD will be performed in accordance with the manufacturers' technical instruction books

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(TIB) and applicable Agency orders. Additional testing may be required to satisfy specific site requirements.

85.-89. RESERVED.

CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. MAINTENANCE CONCEPT. The design and operational characteristics of the NAS maintenance concept are described in Order 6000.30B, Policy for Maintenance of the NAS Through the Year 2000. The ARSR-3 LRR System is supported in compliance with standard Agency maintenance policy. The general approach to maintenance is to monitor the system locally, at a central location, with problems being diagnosed to the line replaceable unit (LRU) level. All failed LRU's, will be forwarded to the Logistics Center for repair and/or replacement.

91. TRAINING. Leapfrog systems training requirements will be determined by the AF sector with course(s) availability arranged by ASM-250 with the FAA Training Academy (AMA) to ensure completion of training requirements prior to the Leapfrog equipment installation to obviate delays in commissioning.

92. SUPPORT TOOLS AND TEST EQUIPMENT. All special tools, special test equipment, and other support equipment for the Leapfrog systems and equipment will be released by the donor site and Leapfrogged, by the TAC, along with ARSR-3 system and supporting equipment. For newly established sites, a limited equipment procurement may be required. Site specific requirements will be determined during the receive site survey. Installation materials will be provided by the TAC, while all equipment furnished will be GFE.

93. SUPPLY SUPPORT. The donor site will provide an inventory of available Leapfrog spares on a computer diskette to be included with the shipment to the receive site. Spares will be the responsibility of each respective receive site and should be requisitioned, per ISSAC, prior to Leapfrog of the system and equipment. LRU's not "spared" at the site will be ordered directly from the Logistics Center in accordance with Orders 4250.9 and 4650.7, Field Material Management and Control, and Management of Project Material, respectively. All spares required during the installation phase will be provided from operating stock or by the Logistics Center.

94. EQUIPMENT REMOVAL and DISPOSITION. The ARSR-1/2 or FPS-67b equipment removal and disposal will be in accordance with Order 4800.2A, Utilization and Disposal of Excess and Surplus Property, local, state, and other federal requirements for disposal of hazardous materials, or as otherwise determined at that time. All contractor actions regarding the handling, storage, security, transporting, and disposal of equipment must comply strictly with all FAA policies and procedures, including proper documentation accompanying the action. All other Federal,

state, and local regulations and statutes must also be adhered to during all phases of equipment removal, transportation/shipment, installation, operation, or disposal.

95. FACILITIES. Temporary storage of the Leapfrog equipment will be provided at, or near, the receive site prior to installation, as required.

96.-99. RESERVED.

APPENDIX 1. ABBREVIATIONS & ACRONYMSORGANIZATION SYMBOLS.

AAP	Program Manager for Advanced Automation
ABU	Office of Budget
ACE	Federal Aviation Administration Central Region
ACN	Engineering, Test, and Evaluation Service (ACT)
ACO	Administrative Contracting Officer
ACS	Assistant Administrator for Civil Aviation Security
ACT	FAA Technical Center
AEA	Federal Aviation Administration Eastern Region
AF	Airway Facilities
AFS	Flight Standards Service
AFSFO	Airway Facilities Sector Field Office
AFSO	Airway Facilities Sector Office
AGC	Office of the Chief Counsel
AGL	Federal Aviation Administration Great Lakes Region
AHT	Office of Training and Higher Education
AMA	Federal Aviation Administration Training Academy
AMC	Mike Monroney Aeronautical Center
ANA	Program Director for Automation
ANR	Program Director for Surveillance
ANS	NAS Transition and Implementation Service
AOS	Operational Support Service
ASE	NAS System Engineering Service
ASM	Systems Maintenance Service
ASU	Associate Administrator for Contracting and Quality Assurance
AT	Air Traffic
ATM	Office of Air Traffic System Management
ATP	Air Traffic Rules and Procedures Service
ATR	Air Traffic Plans and Requirements Service
FAA	Federal Aviation Administration

PROGRAM MANAGEMENT.

PM	Program Manager
ATO	Alternate Technical Officer
APMA	Associate Program Manager for the FAA Academy
APMC	Associate Program Manager for Contracting
APMCE	Associate Program Manager for the Central Region
APMD	Associate Program Manager for the Logistics Center
APME	Associate Program Manager for Engineering
APMEA	Associate Program Manager for the Eastern Region
APMGC	Associate Program Manager for General Counsel
APMGL	Associate Program Manager for the Great Lakes Region
APML	Associate Program Manager for Logistics
APMNE	Associate Program Manager for the New England Region

APMNM	Associate Program Manager for the NW Mountain Region
APMP	Associate Program Manager for ATC Procedures
APMQ	Associate Program Manager for Quality
APMR	Associate Program Manager for ATC Requirements
APMSE	Associate Program Manager for Systems Engineering
APMSM	Associate Program Manager for Systems Maintenance
APMSO	Associate Program Manager for the Southern Region
APMSW	Associate Program Manager for the Southwest Region
APMT	Associate Program Manager for Testing
APMWP	Associate Program Manager for the Western-Pacific Region
RAPM	Regional Associate Program Manager
TO	Technical Officer
TOR	Technical Officer's Representative (Onsite)

ACRONYMS

A/C	Air Conditioning
AC	Alternating Current
AERA	Advance en route Automation
Ant	Antenna
APG	Azimuth Pulse Generator
ARSR	Air Route Surveillance Radar (En Route) (Long Range)
ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal System
ASR	Airport Surveillance Radar System
Assy	Assembly
ATC	Air Traffic Control
ATCBI	Air Traffic Control Beacon Interrogator
ATCRBS	Air Traffic Control Radar Beacon System
BFTA	Beacon False Target Analysis
Bkr	Breaker
BOS	Beacon-Only Site
bps	Bits per Second
BUEC	Back Up Emergency Communications
CAE	Call for Estimates
CB	Circuit Breaker
CAI	Contractor Acceptance Inspection
CCB	Configuration Control Board
CCD	Configuration Control Decisions
CD 1	Common Digitizer-Mdl 1, 1 channel
CD 2	Common Digitizer-Mdl 2, 2 Channels
CDJB	Common Digitizer Junction Box
CDR	Critical Design Review
Cir	Circuit
CIP	Capital Investment Plan
COMDIG	Common Digitizer Data Reduction
COMM	Communications
Cont	Control

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Appendix 1

COTR	Contracts Officer's Technical Representative
CP	Circular Polarization
CPCI	Computer Program Configured Item
CPME	Calibration Performance Monitoring Equipment
SER	Site Engineering Report
CY	Calendar Year
DEDS	Data Entry Display System
DEMARC	Demarcation point (junction box)
DLP	Data Link Processor
DOC	Date of Contract
DRR	Deployment Readiness Review
DT&E	Development, Test and Evaluation
E/G	Engine Generator
EIB	Equipment Instruction Book
F&E	Facilities and Equipment
FAR	Federal Acquisition Regulations
FPS	Fixed Pulse Surveillance Radar System (Military)
FRB	Facilities Review Board
FRDF	Facilities Record Data Form
FT&E	Field Test and Evaluation
GFE	Government-Furnished Equipment
GFM	Government-Furnished Material
ICD	Interface Control Document
IFR	Instrument Flight Rules
ILS	Integrated Logistics Support
ILSMT	Integrated Logistics-Support Management Team
ILSP	Integrated Logistics Support Plan
IPA	Intermediate Power Amplifier
ISM	Integral System Monitor
ISP	Integrated Support Plan
ISSAC	Initial Supply Support Allowance Chart
ITP	Integration Test Plan
JAB	Joint Acceptance Board
JAI	Joint Acceptance Inspection
JB	Junction Box
JSS	Joint Surveillance Site (Joint-Use)
JV	Joint Venture
KW	Kilowatts
LOA	Letter of Agreement
LP	Linear Polarization
LRR	Long-Range Radar
LRU	Line Replaceable Unit
MIM	Military Interface Module
MIMCJB	MIM Cable Junction Box
MODEM	Modulator Demodulator unit
Mod	Modulator
Mods	Modifications
Mode S	Mode Select Beacon Sensor System
MPS	Maintenance Processor Subsystem

MSA	Major System Acquisition
MTBF	Mean-Time-Between-Failures
MTTR	Mean-Time-to-Repair
NADIF	NAFEC Dipole Integral Feed (beacon antenna)
NAILS	National Airspace Integrated Logistics Support
NAILSMT	National Airspace Integrated Logistics Support Management Team
NAFEC	National Airway Facilities Experimental Center
NAS	National Airspace System
NICS	National Inter-facility Communications Service
NTP	Notice-to-Proceed
NYMA	NYMA, Inc (Contractor)
ORD	Operational Readiness Demonstration
OT&E	Operational Test and Evaluation
PA	Power Amplifier
PAT&E	Production Acceptance Test and Evaluation
PCS	Power Conditioning Source
PDP	Power Distribution Panel
PDR	Preliminary Design Review
PFN	Pulse Forming Network
PIP	Project Implementation Plan
PRF	Pulse Repetition Frequency
PS	Power Supply
PSF	Program Support Facility
PSRB	Project Status Review Board
QA	Quality Assurance
QARS	Quick Analysis on Radar Sites
QRO	Quality and Reliability Officer
RAM	Random Access Memory
R&D	Research and Development
RBPM	Radar Beacon Performance Monitor
RCAG	Remote Communications Air-to-Ground
RCVR	Receiver
RCIU	Remote Control Interface Unit
RCL	Remote Communications Link
RCJB	Remote Cable Junction Box
RF	Radio-Frequency
RIVDIF	Riverhead Modified Version of NADIF Beacon Antenna
RMA	Reliability, Maintainability, and Availability
RML	Radar Microwave Link
RMM	Remote Maintenance Monitor
RMMS	Remote Maintenance Monitoring System
RMS	Remote Maintenance System
RPMS	Regional Project Management System
RSM	Remote System Monitoring
RSC	Raytheon Service Company (contractor)
RSSC	Raytheon Support Service Company (contractor)
RRWDS	Radar Remote Weather Display System
RRWDSJB	Radar Remote Weather Display System Junction Box

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Appendix 1

Rx	Receiver
SARC	System Acquisition Review Committee
SEB	Source Evaluation Board
SEI	System Engineering and Integration
SER	Site Engineering Report
SOI	System Operational Inspection
SOW	Statement of Work
SPR	Site Preparation Report
SS	Solid-State
TAC	Technical Assistance Contract(or)
TBD	To Be Determined
T&E	Test and Evaluation
TD	Test Director
TELCO	Telephone Company
TELCOM	Telephone Communications
TIB	Technical Instruction Book (Manufacturer's)
TMLR	Television Microwave Link Repeater
TO	Technical Officer
TOY	Time of Year
TOR	Technical Officer's Representative
TRACAB	Terminal Radar Approach Control in Tower Cab
TRACON	Terminal Radar Approach Control
TRACS	Transportable Radar Analysis Computer System
TS	Test Set
TSARC	Transportation Systems Acquisition Review Council
TSC	Transportation Systems Center
Tx	Transmitter
Tx/Rx	Transmitter/Receiver
UPS	Uninterruptible Power Source
VOT	Very High Frequency Omni-directional Range Test System
WG	Waveguide
Wx	Weather
XMTR	Transmitter

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Appendix 2

APPENDIX 2. ARSR LEAPFROG DEPLOYMENT SCHEDULE
FIGURE 1. ARSR-3 DONOR/RECEIVE SITES

DONOR SITE	RLSE DATE	TYPE of SITE	RECEIVE SITE	ORD
Mt Laguna, CA	04/94	ARSR-1E	San Pedro, CA	04/94
Mt Kaala, HI	04/95	-NEW-	Burns, OR	04/96
Rocksprings, TX	01/96	-NEW-	Arbuckle, OK	01/97
Cross City, FL	05/95	FPS-67b	Haleyville, AL	05/96
FT Lonesome, FL	08/95	BOS	Samburg, TN	08/96
Nashwauk, MN	09/95	ARSR-2	Tyler, MN	09/96
Lakeside, MT	10/95	-NEW-	Sand Spring, MT	10/96
Riverhead, NY	12/95	FPS-67b	Benton, PA	12/96
Empire, MI	01/96	-NEW-	Medford, WI	01/97
Finley, ND	01/96	ARSR-2	Salt Lake, UT	01/97

NOTE 1. Site locations are per NAS 1000, Vol. 1, Appendix II, page 402, dtd June 1990, except: San Pedro, CA
Haleyville, AL

Figure 2. DONOR/RECEIVE SITES for ATRBS SYSTEMS

DONOR SITE	ATCBI	TYPE of SITE	RECEIVE SITE	DATE
Roanoke, VA	5	-NEW-	Burns, OR	04/96
Rocksprings, TX	5	-NEW-	Arbuckle, OK	01/96
Jackson, MS	5	-NEW-	Sand Spring, MT	10/96
Fallon, NV	5	-NEW-	Medford, WI	01/97

APPENDIX 3. OUTSIDE TECHNICAL SUPPORT

1. NYMA, Inc. Provides broad engineering support for the ARSR-3 Leapfrog project to include program engineering support, field engineering support, technical services support, development of PIP, transition plans, specifications, and other technical documents, as required.

2. Technical Assistance Contractor. A Technical Assistance Contractor may provide field engineering and technical support, perform system and equipment removal, shipment/transportation, and installation services, system and equipment OT&E, updating the site as-built drawings, training, and other technical support as required.

3. Systems Engineering and Integration Contractor. Provides schedule and financial planning for the ARSR-3 Leapfrog project in support of the Program Office.

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Appendix 4

APPENDIX 4. LEAPFROG DISPOSAL SITES
ARSR-1, -2, AND FPS-67b SYSTEMS

TYPE of SITE	LOCATION	DATE	TO
ARSR-1E	SAN PEDRO, CA	07/94	DISPOSAL
ARSR-1E	HALEYVILLE, AL	07/94	DISPOSAL
ARSR-2	TYLER, MN	09/94	DISPOSAL
FPS-67b	BENTON, PA	12/95	DISPOSAL
ARSR-2	SALT LAKE, UT	01/97	DISPOSAL

